REPORT RESUMES

ED 016 767 VT 000 486

THE MEASUREMENT OF VOCATIONAL NEEDS. MINNESOTA STUDIES IN VOCATIONAL REHABILITATION, NUMBER 16.
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MINNESOTA UNIV., MINNEAPOLIS, IND. RELAT. CENTER
REPORT NUMBER BULL-39 PUB DATE APR 64
EDRS PRICE MF-$0.50 HC-$4.24 104P.

DESCRIPTORS- QUESTIONNAIRES, *INDIVIDUAL NEEDS, *TEST CONSTRUCTION, *VOCATIONAL ADJUSTMENT, PHYSICALLY HANDICAPPED, EMPLOYMENT LEVEL, COLLEGE STUDENTS, *ATTITUDE TESTS, *OCCUPATIONAL CHOICE, EMPLOYEES, TEST VALIDITY, N FACTORS QUESTIONNAIRE, MINNESOTA IMPORTANCE QUESTIONNAIRE, THEORY OF WORK ADJUSTMENT,

TWO QUESTIONNAIRES FOR MEASURING VOCATIONAL NEEDS WERE DEVELOPED. NEED WAS DEFINED AS "NEED FOR SPECIFIED REINFORCING CONDITIONS IN THE WORK ENVIRONMENT." THE N-FACTORS QUESTIONNAIRE (NFQ) CONSISTED OF 48 TWO-RESPONSE CHOICE ITEMS, FOUR ITEMS FOR EACH OF 12 SCALES--ACHIEVEMENT, AUTHORITY, COWORKERS, CREATIVITY AND CHALLENGE, DEPENDENCE, INDEPENDENCE, MORAL VALUES, RECOGNITION, SECURITY, SELF EXPRESSION, SOCIAL SERVICE, AND SOCIAL STATUS. THE QUESTIONNAIRE WAS COMPLETED BY 1,014 EMPLOYEES (521 DISABLED AND 493 NONDISABLED), AND DATA ANALYSIS INDICATED THAT ONLY FIVE SCALES HAD ADEQUATE RELIABILITIES. THE MINNESOTA IMPORTANCE QUESTIONNAIRE (MIQ) WAS DEVELOPED BY REVISING AND EXPANDING THE NFQ. NEW SCALES WERE ABILITY UTILIZATION, ACTIVITY, ADVANCEMENT, COMPANY POLICIES AND PRACTICES, COMPENSATION, RESPONSIBILITY, SUPERVISION--HUMAN RELATIONS, AND TECHNICAL, VARIETY, AND WORKING CONDITIONS. THE MIQ WAS COMPLETED BY 2,308 EMPLOYEES (DISABLED AND NONDISABLED) REPRESENTING BLUE COLLAR, NONSKILLED WHITE COLLAR, SKILLED WHITE COLLAR AND MANAGERIAL GROUPS, AND 503 COLLEGE STUDENTS. THE MIQ SCALES WERE SHOWN TO HAVE HIGH RELIABILITIES, AND APPEARED TO BE USEFUL IN VOCATIONAL DIAGNOSIS. DATA SUPPORTED THE ASSUMPTION THAT DISABILITY AFFECTS PERSONALITY. IT SUPPORTED THE "THEORY OF WORK ADJUSTMENT" WHICH STATED THAT THE NEED SET OF AN INDIVIDUAL UNDERGOES SOME CHANGES IN STRUCTURE WHEN THE INDIVIDUAL EXPERIENCES THE REINFORCERS IN WORK. (PA)

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ED016767

UNIVERSITY OF MINNESOTA

INDUSTRIAL RELATIONS CENTER

minnesota studies in
vocational rehabilitation: xvi

The Measurement of Vocational Needs

April 1964
Bulletin 39

VT000486

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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MINNESOTA STUDIES IN VOCATIONAL REHABILITATION

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vocational rehabilitation: xvi

The Measurement of Vocational Needs

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The Minnesota Studies in Vocational Rehabilitation are supported, in part, by a research Special Project grant from the Vocational Rehabilitation Administration, Department of Health, Education, and Welfare.

All computations reported in this Bulletin were carried out on the Control Data Corporation 1604 Scientific Computer, at the Numerical Analysis Center, University of Minnesota.

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The Measurement of Vocational Needs

Summary

This bulletin reports on the development of two questionnaires as measures of vocational needs. The first questionnaire developed, the N-Factors Questionnaire (NFQ), consisted of 48 two-response-choice items, 4 items for each of the following 12 scales: Achievement, Authority, Co-workers, Creativity and Challenge, Dependence, Independence, Moral Values, Recognition, Security, Self-expression, Social Service and Social Status. The questionnaire was completed by 1,014 employed individuals. Analysis of these data indicated that, while the scales were sufficiently independent of each other to be interpretable as unique dimensions, only five scales had adequate reliabilities.

The second questionnaire, the Minnesota Importance Questionnaire (MIQ), was developed by revising and expanding the NFQ. The number of scales was increased to 20, the number of items to five per scale, and the number of response choices to five per item. The NFQ dimensions were incorporated as scales in the MIQ, and the following scales were added: Ability Utilization, Activity, Advancement, Company Policies and Practices, Compensation, Responsibility, Supervision—Human Relations, Supervision—Technical, Variety and Working Conditions. The MIQ was completed by 2,308 employed individuals. The MIQ scales were shown to have high reliabilities. While the scale intercorrelations were higher than desired, analysis indicated that there was sufficient specific variance in most of the scales to permit their being interpreted as relatively unique dimensions.

MIQ results were analyzed further to determine whether or not its scales differentiated groups in accordance with expectations derived from the *Theory of Work Adjustment*, and whether or not differences existed between disabled and non-disabled workers. Following are the principal findings from these analyses:

1. Disabled and non-disabled workers differed in both level and variability on several of the MIQ scales. Generally, mean scale scores were higher for the non-disabled, but variability was greater for the disabled. Relative rankings of needs also differed for the two groups on some scales. Disabled and non-

disabled workers differed little in the factor structure of their needs as measured by the MIQ. There was some indication that "status" needs (Authority, Independence, Social Status) were stronger for the disabled (i.e., these constituted more preferred reinforcers), while work-oriented needs (Achievement, Advancement, Company Policies and Practices, Coworkers, Moral Values, Security, Social Service, Supervision-Human Relations, and Supervision-Technical) were stronger for the non-disabled. Response to the MIQ was slightly more reliable for the disabled than for the non-disabled, but for both groups, all scale reliabilities were high.

2. Occupational differences were observed in level, variability, and ranking on many of the MIQ scales. The managerial group had the highest mean and the smallest variability in scores on Ability Utilization, Achievement, Advancement, Compensation, Creativity, Recognition, Responsibility, and Variety. High mean and low variability also characterized the response of skilled white-collar workers on Security and Working Conditions, and of the nonskilled white-collar workers on Moral Values and Activity. The nonskilled blue-collar workers generally showed the largest variability and the lowest means. Security was ranked highest by the non-managerial groups, while the managerial group ranked Advancement highest. All groups ranked Authority, Independence, and Social Status as least important. The factor structures underlying response to the MIQ were similar for the three non-managerial groups. Covariation on the MIQ scales could be represented on two dimensions for non-managerial workers. For managers, however, three dimensions were required. The four occupational groups showed high reliabilities on most scales.

3. Presence or absence of employment experience was related to response on the MIQ. A pre-employment group of college students differed from an employed group of skilled white-collar and managerial workers in means, variabilities and ranks of scale scores. On all but one scale, means were lower and variabilities greater for the pre-employment group. While the two groups also differed in their rankings of scales, both ranked Ability Utilization first and Social Status last. Three dimensions were required to account for scale covariation for the pre-employment group, but the factor structure observed was

different from that of either the managerial or the skilled white-collar groups.

These findings are consistent with predictions from the *Theory of Work Adjustment* concerning occupational differences and employment experience differences in need patterns. They thus constitute construct validity for several of the MIQ scales. In addition to these first evidences of validity, scores on the MIQ scales were found to be sufficiently stable (test-retest reliability) to warrant its further use as a research instrument.

Plans for improvement of the MIQ are presented, along with descriptions of validity studies which are being undertaken. The projected development of Occupational Reinforcer Patterns (to complement Occupational Ability Patterns) is briefly described.

The final section presents directions for use of the MIQ and available norms.

Introduction

The *Theory of Work Adjustment*[1] focuses on two sets of variables —abilities and needs—as important to the description of the work personality and to the explanation of work adjustment. "Abilities" refer to dimensions of response while "needs" have reference to dimensions of reinforcement experience. Response and reinforcement are separate concepts, and therefore abilities and needs are measured as independent, if interacting, systems of variables.

Since World War I, much research in vocational, occupational, and personnel psychology has been devoted to the identification and measurement of abilities. Needs, on the other hand, have received relatively little attention in vocational research. For this reason, a major effort has been made in the Work Adjustment Project to develop an adequate measure of vocational needs.

This Bulletin reports on the development of two instruments for the measurement of vocational needs. The first of these instruments pre-dated the *Theory of Work Adjustment* and was guided primarily by previous work in the area. The second instrument was developed simultaneously with the theory and was guided by a combination of past experience and present theory.

The *Theory of Work Adjustment* defines needs as "dimensions of reinforcement experience associated with classes of stimulus conditions which operate differentially as effective reinforcers." An individual's need set grows out of his reinforcement history. While each individual's reinforcement history is unique, the *Theory* implicitly assumes that all individuals in a given culture are exposed to certain common experiences in their history. As a result, certain common dimensions of the environment will be identifiable as reinforcers for most individuals. There will be other environmental dimensions which have reinforcing properties peculiar to a given individual or to a small subgroup of individuals in a given culture. The focus of need measurement reported in this Bulletin is on those dimensions of the work environment which are common enough to result in a set of needs that are identifiable for most individuals in our culture.

In the context of this Bulletin, then, a "need" is viewed as a "need-for-specified-reinforcing-conditions-in-the-work-environment." It is further intended that the dimensions to be included in a need instrument are those which are common to the majority of working people.

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[1] Dawis, R. V., England, G. W., and Lofquist, L. H. *Minnesota studies in vocational rehabilitation, XV. A theory of work adjustment.* Industrial Relations Center, University of Minnesota, 1964.

Considerations in need measurement

For the purposes of the Work Adjustment Project, certain characteristics were regarded as important and desirable in a measure of vocational needs.

One requirement for a need instrument is reliability. Scores on a need instrument should be reliable in two ways: they should be internally consistent and they should accurately reflect real changes in what is being measured. Internal consistency reliability is at its maximum when error variability is at a minimum. Error variability occurs when an individual's response to one or more items in a scale is inconsistent with his general pattern of response on the scale.

The *Theory of Work Adjustment* states that the need set of an individual undergoes some changes in structure when the individual experiences the reinforcers in work. Needs, therefore, are expected to be less stable for certain groups of people than for others. For example, needs for persons with little or no work experience would be expected to be less stable than those for persons with many years of work experience and particularly so for the more exclusively work-oriented needs. Because of these theoretical expectations, it becomes important that a need instrument accurately reflect actual need changes as they occur. On the other hand, stability of scores over time is also important if the need instrument is to be utilized for prediction.

Validity is another basic requirement in need measurement. There should be repeated demonstration that the need instrument is in fact measuring what it is supposed to be measuring. One such demonstration, for example, would be need score differences among groups of satisfied individuals in different occupations (since, according to the *Theory of Work Adjustment,* a need instrument should reflect the differential effectiveness of different stimulus conditions as reinforcers of work behavior.) Furthermore, since validity depends on reliability, reliability again becomes of prime importance.

Unidimensionality of scales is a desirable characteristic in a measure of needs. Unidimensional scales facilitate the interpretation of validity studies. There is less ambiguity in a finding where it is known that the scale is measuring only one dimension.

Independence of scales, likewise, is a desirable characteristic in a need instrument. Again, there is less ambiguity in a finding where it is known that each scale is measuring something different from that measured by other scales.

For the purposes of the Work Adjustment Project, it was desired that the range of need dimensions measured by the instrument should sample the range of reinforcers commonly found in the work environment. In addition, trans-situational need dimensions were desired, i.e., need dimensions present in a large variety of occupations. If need dimensions were to cut across all types of occupations, it was also deemed important that the vocabulary of the instrument be just as intelligible for a manual laborer as for a college professor.

Furthermore, the data collection procedures used in the Work Adjustment Project made it imperative that a need instrument be easy to administer, if possible, completely self-administering. It was also desired that the need instrument be designed to minimize errors in scoring, and allow scoring to be done by relatively untrained personnel or by electronic data processing equipment.

Since the need instrument was intended primarily for the Work Adjustment Project, which depends on the voluntary cooperation of large numbers of working people, "face validity" was a final important consideration. It was desired to have a need instrument which would appear to cooperating individuals to be relevant and consistent with the research goals outlined to them.

The paper and pencil approach to need measurement

The *Theory of Work Adjustment* defines needs as "dimensions of reinforcement experience associated with classes of stimulus conditions which operate differentially as effective reinforcers." This definition implies a measurement procedure in an experimental setting, where various classes of stimulus conditions can be presented experimentally to an individual and the reinforcement values of these stimulus conditions measured as an index of need strength. This type of procedure should result in the most valid measurement of needs, but it does not fulfill some of the desired characteristics of a need measure outlined above, in particular, ease of administration.

Because of the impracticality of the experimental approach for the Work Adjustment Project at the present time, a paper-and-pencil approach to need measurement was attempted. While an experimental approach yields a direct estimate of need strength, a paper-and-pencil approach yields the respondent's evaluation of his needs in relation to the reinforcers specified in the questionnaire items. The paper-and-pencil approach is therefore an inferential approximation of need strength based on self-report.

Measurement in a relatively new area, such as vocational needs, must deal with the problem of item sampling. Generally, two types of item sampling procedures are used: *domain* sampling and *dimension* sampling. Initially, items may be drawn from a wide variety of sources, such as books, articles, other questionnaires, and experience, to sample adequately the new *domain* of measurement. Domain sampling results in an instrument usually characterized by relatively low intercorrelations among the items, with some subsets of items having higher correlations among each other than with the remaining items. Factor analysis of the item intercorrelations reveals the *dimensions* necessary to represent the domain adequately.

Scales may then be developed to measure the dimensions which appeared in the factor analysis of the "domain sampling" items. First, the dimensions to be measured are defined explicitly, and then items are written to "sample" each specified dimension. Good dimension sampling is characterized by relatively high item intercorrelations, with all items in a scale correlated with each other at approximately the same (high) level.

The first instrument reported on in this Bulletin was developed by a combination of domain and dimension sampling procedures. Benefiting from this experience, a second instrument was constructed using dimension sampling.

Other need-measuring instruments

It was suggested in Bulletin X of the present series[2] that a measure of "vocational needs" would be necessary in the study of work adjustment. The Edwards Personal Preference Schedule[3] (EPPS) was considered for that purpose. However, further study indicated that the EPPS was inappropriate for use in the Work Adjustment

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[2] Scott, T. B., Dawis, R. V., England, G. W., and Lofquist, L. H. *Minnesota studies in vocational rehabilitation, X. A definition of work adjustment.* Industrial Relations Center, University of Minnesota, 1960.

[3] Edwards, A. L. New York: Psychological Corporation, 1953.

Project. This conclusion was reached on several grounds. First, since it was planned to study vocational needs among persons employed at all levels of the occupational hierarchy, the language level of the EPPS was found inappropriate for many employed persons, especially those in unskilled and semi-skilled jobs.

Secondly, the EPPS appeared to lack sufficient face validity for working people. The items, the format and some of the scales, e.g., heterosexuality, aggression, and exhibition, did not appear to be relevant to a study of adjustment at work.

Finally, the fact that the EPPS was developed and standardized exclusively on college students raised serious doubts about its applicability to the general working population.

A monograph by Schaffer[4] was studied as a possible source of a relevant instrument. It appeared that Schaffer's conceptualization of need dimensions was appropriate for the study, and consideration was given to the instrument he developed. However, only three of Schaffer's twelve need scales had reliabilities which were adequate by the usual criterion ($r = .80$ or greater). Since internal consistency reliability was a prime technical requirement for the desired measure of needs, Schaffer's instrument was not used.

The third instrument considered was Super's *Work Values Inventory*[5] (WVI). Although many of the WVI scales related to dimensions which could be construed as vocational needs, such scales as Altruism, Way of Life and Esthetic appeared to relate more to "life values" than to vocational needs. While the *Theory of Work Adjustment* does not deal with "values," it would seem that "values" relate to much broader classes of reinforcers which range well beyond the work environment. Super actually differentiates between "needs" and "values" when he states: "A second problem connected with the measurement and study of values is that of the identification and description of values *as distinguished from* interests, *needs,* adjustment and other personality variables."[6] (Italics are added.) Thus the WVI, by its title and the intent of its author, was oriented primarily toward "values."

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[4] Schaffer, R. H. Job satisfaction as related to need satisfaction in work. *Psychol. Monogr.,* 1953, No. 364.

[5] See, for example, Super, D. E., and Overstreet, Phoebe L. *The Vocational Maturity of Ninth Grade Boys,* New York: Teachers College, Columbia University, Bureau of Publications, 1960.

[6] Super, D. E. The structure of work values in relation to status, achievement, interests, and adjustment, *J. appl. Psychol.,* 1962, *46,* p. 231-2.

Since all three instruments appeared inappropriate as measures of vocational needs for the Work Adjustment Project, development of a new instrument was initiated. This Bulletin reports the results of these developmental efforts.

The N-Factors Questionnaire

The first Work Adjustment Project attempt to measure vocational needs was based largely on the work of Schaffer.[7] Schaffer's twelve dimensions were used as the basis for the construction of the N-Factors Questionnaire (NFQ).

Description

The NFQ consists of 48 items; four items for each of the twelve dimensions.[8] Each item constitutes a reason for considering an occupation as "ideal." The questionnaire first asks the person responding to specify his ideal occupation. The respondent then evaluates each of the 48 items as to whether or not it is a reason for considering the occupation as ideal. The respondent is asked to "answer every statement by saying . . . 'I think this occupation is the ideal occupation for me because . . .'." From the respondent's reasons for his choice of an ideal occupation, a quantitative index of the respondent's preference for different reinforcers or reinforcement conditions is obtained. The NFQ thus represents an approach to need measurement which operationally defines "needs" as expressed preferences for reinforcers.

Response to each of the 48 items is simply a "yes" or a "no." The questionnaire is scored by assigning a value of 1 to a "yes" response and 0 to a "no" response. Thus, scores on a given scale can vary from 0 to 4.

The twelve need dimensions of the NFQ, and brief descriptions of scale content, are as follows (in alphabetical order):

Achievement: doing a good job; pride in doing good work

Authority: telling others what to do; being a leader

Co-workers: working with a group of people; not working alone

Creativity and Challenge: doing new things; inventing new approaches to the job

Dependence: not making one's own decisions; not having a lot of responsibility

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[7] *op. cit.*

[8] A copy of the questionnaire appears in the Appendix.

Independence: being one's own boss; working alone

Moral Values: not doing things which are felt to be wrong; doing things which agree with religious beliefs

Recognition: getting credit for good work; knowing that someone appreciates a good job

Security: having the security of knowing that pay is forthcoming; not worrying about becoming unemployed

Self-expression: being able to express one's self; acting the way one feels

Social Service: helping people; getting pleasure from helping others

Social Status: getting a chance to meet important people; having the material evidences of high social status

Data collection

A total of 1,014 completed questionnaires was obtained for analysis. These questionnaires were collected as part of the data collection procedure followed for the Work Adjustment Project.[9] The NFQ was administered at one of two points in the data collection procedure. Interviewees who did not wish to participate in the psychological testing phase of the project were asked to fill out the NFQ as part of the home interview. For the interviewees who participated in the psychological testing, the NFQ was administered as part of the psychometric battery. Using this approach, completed questionnaires were obtained from 521 disabled and 493 nondisabled workers.

Sample characteristics

The descriptive characteristics of the NFQ sample are shown in Table 1. The median age for the sample was 31 years. One third of the 521 disabled workers had orthopedic disabilities. The neuropsychiatric and mental retardation group comprised 17% of the dis-

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[9] See, for details of the data collection process, Carlson, R. E., Dawis, R. V., England, G. W., and Lofquist, L. H. *Minnesota studies in vocational rehabilitation, XIII. The measurement of employment satisfaction.* Industrial Relations Center, University of Minnesota, 1962, pp. 10-12.

Table 1. Descriptive characteristics of NFQ Work Adjustment Project sample (N = 1,014)

Characteristic	N	%
Age		
less than 30	329	32
30 to 44	396	39
45 and over	289	29
Disability Status		
Disabled	521	52
Non-disabled	493	48
Education		
less than 12 years	350	34
12 years completed	394	39
12 to 15 years	133	13
16 years and over	137	14
Employment Status		
full-time	980	97
part-time	34	3
Occupation		
Nonskilled Blue Collar	314	31
Skilled Blue Collar	198	20
Nonskilled White Collar	228	22
Skilled White Collar	212	21
Managerial and Professional	62	6
Sex		
Male	786	78
Female	228	22

abled group; cardiovascular and systemic disabilities, 13%; visual and hearing impairments, 12%; neurological disabilities, 11%; and respiratory disabilities, 10%.

About one-fourth of the total sample reported some college education, while one-third did not complete high school. Ninety-seven per cent were employed full-time at the time the questionnaires were completed. The majority of respondents were employed in blue-collar jobs, but the range of jobs spanned the major occupational categories. The sample was predominantly male (78%).

Results

Level and variability: Table 2 presents data on level and variability of scores on each of the 12 scales. Scale means varied from 3.4 (Achievement) to 1.6 (Authority and Dependence). This suggests that responses to the items were neither random nor all in the same direction. The data also show that, for this sample, achievement, creativity-challenge, and social service were the most frequently given considerations in the choice of an ideal occupation, whereas authority, dependence, and social status were least frequently chosen.

Table 2 also shows that the least variability in scores was on the Achievement scale, and the most variability on the Social Status scale. The standard deviations of the scales indicate that the large majority of the scores on the Achievement scale were between 3 and 4 (the highest possible score.) This suggests that the Achievement scale had relatively little discriminating power for this group of individuals. On the Social Status scale the majority of the scores lay between 0 and 3. This indicates relatively good discrimination for this scale. The score variabilities for the remaining scales fell between these two extremes.

Table 2. Means and standard deviations on NFQ scales, for Work Adjustment Project sample (N = 1,014)

Scale	Mean	Standard Deviation
1. Achievement	3.41	.85
2. Authority	1.62	1.34
3. Co-workers	2.72	1.21
4. Creativity and Challenge	3.11	1.13
5. Dependence	1.63	1.21
6. Independence	1.99	1.30
7. Moral Values	2.46	1.26
8. Recognition	2.70	1.30
9. Security	2.37	1.37
10. Self-expression	2.00	1.12
11. Social Service	3.33	1.11
12. Social Status	1.80	1.40

Table 3 presents item means and variances. Since items were scored 0 for a "no" response and 1 for a "yes" response, the item mean is the proportion of the sample answering "yes" to the item. Table 3 shows the highest proportion of positive responses was to Item 42 (96%), while Item 27 had the lowest proportion of positive responses (20%). The item standard deviations show that Items 2, 7, 11, 17, 26, 29, 30, 40 and 45 had the most variability, while Items 33, 42, and 44 had the least variability. Table 4 shows the scale membership of each of the 48 items of the NFQ.

Table 3. Means and standard deviations of NFQ items, for Work Adjustment Project sample (N = 1,014)

Item	Mean	Standard Deviation	Item	Mean	Standard Deviation
1	.76	.43	25	.37	.48
2	.48	.50	26	.56	.50
3	.75	.43	27	.20	.40
4	.34	.48	28	.76	.43
5	.81	.39	29	.47	.50
6	.41	.49	30	.50	.50
7	.43	.50	31	.67	.47
8	.68	.47	32	.76	.43
9	.41	.49	33	.94	.24
10	.77	.42	34	.27	.44
11	.52	.50	35	.87	.34
12	.34	.48	36	.22	.42
13	.68	.47	37	.84	.36
14	.77	.42	38	.71	.45
15	.87	.34	39	.74	.44
16	.42	.49	40	.43	.50
17	.57	.50	41	.73	.45
18	.25	.43	42	.96	.18
19	.73	.44	43	.33	.47
20	.68	.47	44	.88	.32
21	.40	.49	45	.50	.50
22	.84	.36	46	.58	.49
23	.76	.43	47	.65	.48
24	.75	.43	48	.76	.43

Table 4. Item composition of NFQ scales

Scale	Item Numbers			
1. Achievement	3	24	33	42
2. Authority	4	13	34	43
3. Co-workers	2	23	32	41
4. Creativity and Challenge	10	19	28	37
5. Dependence	9	18	27	48
6. Independence	12	21	30	39
7. Moral Values	8	17	26	47
8. Recognition	1	22	31	40
9. Security	11	20	29	38
10. Self-expression	6	15	36	45
11. Social Service	5	14	35	44
12. Social Status	7	16	25	46

Reliability: Hoyt analysis-of-variance reliability coefficients for each of the 12 NFQ scales are listed in Table 5. These coefficients appear in the diagonal of the matrix. Unlike correlational reliability coefficients, Hoyt coefficients represent the proportion of the total variance of scores which is reliably due to individual differences among the respondents. Correlational reliability coefficients are equal to the square root of the Hoyt reliability coefficients. Thus, a Hoyt reliability coefficient of .64 is equal to a correlational reliability coefficient of .80. Both these coefficients indicate that 64% of the total variance is reliable.[10]

Table 5. Reliabilities and intercorrelations of NFQ scales, for Work Adjustment Project sample (N = 1,014)

Scale	1	2	3	4	5	6	7	8	9	10	11	12
1. Achievement	**47**[a]											
2. Authority	29	**70**										
3. Co-workers	30	18	**60**									
4. Creativity and Challenge	33	33	05	**62**								
5. Dependence	21	−05	41	−05	**63**							
6. Independence	25	40	−04	28	−01	**61**						
7. Moral Values	37	27	31	13	34	31	**55**					
8. Recognition	45	25	45	13	43	18	39	**71**				
9. Security	31	16	41	00	48	18	43	45	**68**			
10. Self-expression	35	24	17	26	22	37	40	36	31	**50**		
11. Social Service	25	13	40	14	25	03	29	28	25	14	**74**	
12. Social Status	42	44	41	20	35	25	45	58	44	37	27	**68**

Note: Decimal points omitted.

[a] Bold-face number in diagonal is proportion of total variance that is reliable (Hoyt analysis-of-variance reliability coefficient).

The Hoyt reliability coefficients shown in Table 5 indicate that only five scales had reliabilities which were "acceptable" by the usual criterion of r = .80 or greater (i.e., a minimum of 64% reliable variance). These scales were Authority, Recognition, Security, Social Service and Social Status. Four other scales had from 60% to 63% reliable variance. The remaining three scales—Achievement,

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[10] For a more detailed discussion of the Hoyt reliability coefficient, see Carlson, R. E., Dawis, R. V., England, G. W., and Lofquist, L. H. *Minnesota studies in vocational rehabilitation, XIV. The measurement of employment satisfactoriness*, Industrial Relations Center, University of Minnesota, 1963, Technical Appendix, pp. 50-51.

Moral Values, and Self-Expression—appeared to be relatively unreliable measures.

Covariation: The scale intercorrelations, also presented in Table 5, show that most of the scales were relatively independent of each other. The highest correlation was between Recognition and Social Status ($r = .58$); the lowest correlation, between Security and Creativity-and-Challenge ($r = .00$). Only 17 of the 66 inter-scale correlations were .40 or above, and of these only one was higher than .48. These results suggest that the NFQ did measure several discrete dimensions.

The correlation matrix shows further that no scales measured opposite ends of the same continuum, since there were no significant negative correlations between scales.

Factorial composition: To determine the smallest number of dimensions underlying scale covariation, the intercorrelation matrix (Table 5) was factor-analyzed. The result of the principal components factor solution, with varimax rotation, appears in Table 6.

Two factors were required to account for the common variance among the twelve NFQ scales. The scales with the highest loadings on Factor I were Co-workers, Dependence, Recognition, and Security. These scales, along with Moral Values, Social Service and

Table 6. Varimax factor matrix of NFQ scales, for Work Adjustment Project sample (N = 1,014)

	Factor			
Variable	I	II	Communality	SMC[a]
1. Achievement	.40	.46	.37	.34
2. Authority	.12	.60	.38	.35
3. Co-workers	.65	.04	.42	.39
4. Creativity and Challenge	.00	.51	.26	.23
5. Dependence	.66	−.08	.44	.38
6. Independence	.03	.60	.36	.30
7. Moral Values	.51	.37	.40	.37
8. Recognition	.66	.28	.52	.47
9. Security	.64	.15	.44	.39
10. Self-expression	.32	.47	.33	.31
11. Social Service	.43	.10	.20	.21
12. Social Status	.59	.44	.54	.50
Contribution of Factor	2.79	1.87	4.66	
Proportion of Common Variance	.60	.40	1.00	

[a] Estimated communalities: Squared multiple correlation coefficients.

Social Status, loaded principally on Factor I. Authority, Creativity and Challenge, Independence, and to a lesser degree, Achievement and Self-Expression, loaded principally on Factor II. Furthermore, Achievement, Moral Values, Self-Expression, and Social Status loaded .30 or higher on both factors.

It would appear from the pattern of factor loadings that Factor I could be labeled an "extrinsic reinforcer" dimension of needs, while Factor II represented an "intrinsic" or "self-reinforcer" dimension. This interpretation is supported by an examination of the item content of the scales defining each factor.

The contribution of the factors, shown in Table 6, is 60% and 40% of the common variance, for Factors I and II respectively. This indicates that there was little general bias operating in the responses to the items. If there were such bias, the factor analysis would have yielded one large factor accounting for a large proportion of the common variance.

The common variance accounted for in this factor analysis represents only about 40% of the total covariation among scales. This is to be expected from the intercorrelations shown in Table 5. It means that there was a relatively large amount of variability in the scales which was not covariant with variability in other scales. From a psychometric point of view, low covariation is desirable because the scales can be interpreted unambiguously as relatively independent dimensions.

Evaluation

The foregoing analysis of the data on the NFQ indicated that only five of the twelve NFQ scales had acceptable reliabilities. This could result from at least two defects in the instrument: (1) Many items had more than one clause. For example, Item 6, "You can say what you think, and do what you think you ought to do and act just the way you feel," has three main clauses. Response to the item could therefore be to any of the clauses included in the item, thus contributing to unreliability; (2) The instructional set could also be a factor in the low reliabilities. Instructions for the NFQ required the individual to answer the questionnaire with a specific "ideal" occupation "in mind." It is probable that some respondents knew less about their ideal occupations than others did, and those who knew less probably gave less consistent answers. Thus, it is possible that response to the NFQ could have been influenced not so much by the "needs" of an individual, but by his knowledge of his ideal occupation.

On the positive side, the NFQ showed some psychometrically desirable characteristics. Most of the items had mean scores and variabilities which indicated adequate discrimination potential. The scales of the questionnaire were relatively independent of each other. The questionnaire was easy to complete, easy to administer and easy to score.

The Minnesota Importance Questionnaire

The development of the Minnesota Importance Questionnaire (MIQ) proceeded from the knowledge gained in developing the NFQ. The MIQ was constructed with three goals in mind: (1) to increase the reliability of scales; (2) to increase the variability of scores; and (3) to increase the number of dimensions measured by the questionnaire.

The first of these goals was approached in several ways. First, dimension sampling was undertaken in a more systematic manner. Each dimension was defined more explicitly, and items were written which concentrated on the relevant aspects of the dimension. As a result, items comprising a scale were similar in content and wording, with only minor differences from item to item.

Secondly, items were phrased in simple terms, and were kept short and to the point. Dependent and qualifying phrases were eliminated or kept to a minimum. All non-essential phrases were eliminated from the items.

Thirdly, the number of items in a scale was increased from four in the NFQ to five on the MIQ, and the response alternatives from two to five.

Finally, the instructions used for the NFQ were modified for the MIQ. The respondent was no longer required to answer the questionnaire in terms of a specified ideal occupation, since this procedure was suspected of introducing the unwanted factor of differential knowledge of occupations. For the MIQ, the respondent was instructed to answer the questionnaire in terms of his "ideal job, the kind of job (he) would most like to have." It was hoped that by leaving the "ideal job" unspecified, respondents would be answering the questionnaire more on the basis of "needs" to be satisfied in *any* ideal job, than of occupational knowledge of the possible reinforcer pattern of a *specified* job.

To increase the variability of scores, the items of the MIQ were constructed as 5-point rating scales, in contrast to the two-choice alternative utilized in the NFQ. As a result of increasing the number of response alternatives and the number of items per scale, potential scores on MIQ scales ranged from 5 to 25, compared with the 0 to 4 range of NFQ scales.

Increase in the number of dimensions measured by the MIQ was based mainly on findings from a previous study of employment satisfaction.[11] The dimensions of job satisfaction which appeared in this study were translated into dimensions of vocational needs for the present study. Other dimensions were added which were derived from a general knowledge of occupational reinforcers. These additions brought the total number of dimensions for the MIQ to 20, compared with 12 dimensions in the NFQ.

Two preliminary forms of the MIQ were tried out on small groups of individuals, and the results used as the basis for further modification of the questionnaire. Items were rewritten and instructions were clarified. A "Flesch count"[12] of the items in the final form showed an average sentence length of 8.4 words, with an average of 76 one-syllable words per hundred words. This count yielded an index of 81, rating the questionnaire in the *very easy* (5th grade level) class.

The sections which follow report on the final form of the MIQ.

Description

The MIQ consists of 100 items.[13] Each item refers to a potential reinforcer of work behavior. In answering the questionnaire, the respondent is directed to ask himself: "How *important* is (the reinforcer) to an *ideal job* for me; the kind of job I would most like to have?" Five response alternatives are presented for each item: "Very Unimportant; Not Important; Neither (unimportant nor important); Important; Very Important."

Each of the 20 scales in the questionnaire consists of five items. The items for a scale are spaced 20 items apart. Thus there are in effect five blocks of 20 items each, with intra-block order invariant for all blocks.

Following (in alphabetical order) is a list of the MIQ scales. The illustrative item after each scale title is the item which correlated most highly with total scale score in four different occupational groups, and for occupational samples of disabled and non-disabled workers.

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[11] Carlson, R. E., *et al. Minnesota Studies in Vocational Rehabilitation, XIII.* op. cit.

[12] See, Farr, J. N., Jenkins, J. J., and Paterson, D. G. Simplification of Flesch reading ease formula. *J. appl. Psychol.*, 1951, *35*, 333-337.

[13] A copy of the questionnaire is included in the Appendix.

1. *Ability Utilization:* I could do something that makes use of my abilities.
2. *Achievement:* The job could give me a feeling of accomplishment.
3. *Activity:* I could be busy all the time.
4. *Advancement:* The job would provide an opportunity for advancement.
5. *Authority:* I could tell people what to do.
6. *Company Policies and Practices:* The company would administer its policies fairly.
7. *Compensation:* My pay would compare well with that of other workers.
8. *Co-workers:* My co-workers would be easy to make friends with.
9. *Creativity:* I could try out some of my own ideas.
10. *Independence:* I could work alone on the job.
11. *Moral Values:* I could do the work without feeling that it is morally wrong.
12. *Recognition:* I could get recognition for the work I do.
13. *Responsibility:* I could make decisions on my own.
14. *Security:* The job would provide for steady employment.
15. *Social Service:* I could do things for other people.
16. *Social Status:* I could be "somebody" in the community.
17. *Supervision—Human Relations:* My boss would back up his men (with top management).
18. *Supervision—Technical:* My boss would train his men well.
19. *Variety:* I could do something different every day.
20. *Working conditions:* The job would have good working conditions.

Data collection

Questionnaires were sent to all 1,469 members of the Work Adjustment Project sample who had participated in previous studies reported in this series. The questionnaires were mailed to each individual's home. Three followups were used to increase the percentage of returned questionnaires. The first followup was a post card, the second a letter, and the third another post card. Thirty-nine questionnaires were returned by the post office as undeliverable. Of the 1,430 questionnaires which were delivered, 72% or 1,029, were returned, 69 of which were incomplete or otherwise unusable. This left a total of 960 usable questionnaires, or a usable return rate of 67%. The 960 questionnaires used in this study were completed by 507 disabled and 453 non-disabled individuals.

Table 7. Descriptive characteristics of MIQ Work Adjustment Project sample (N = 960)

Characteristic	Disabled N	Disabled %	Non-Disabled N	Non-Disabled %
Age				
Less than 30	135	27	80	18
30-44	221	43	200	44
45 and above	151	30	173	38
Disability				
Cardiovascular and systemic	74	15	....	....
Orthopedic	161	32	....	....
Neurological	62	12	....	....
Neuropsychiatric and mental retardation	78	15	....	....
Visual and hearing	47	9	....	....
Respiratory	56	11	....	....
Others	20	4	....	....
Education				
Less than 12 years	137	27	148	33
12 years completed	216	43	179	39
12-15 years	94	18	73	16
16 years and over	60	12	53	12
Occupation				
Nonskilled blue-collar	125	25	104	23
Skilled blue-collar	60	12	88	19
Nonskilled white-collar	115	23	94	21
Skilled white-collar	98	19	111	24
Professional	44	9	26	6
Number of years in present job				
1 or less	70	14	62	14
2-5	199	39	182	40
more than 5	173	34	179	40
Sex				
Male	395	78	347	77
Female	112	22	106	23

Note: Where percentages do not total 100, the remainder represents unclassifiable or missing data.

It should be kept in mind that the Work Adjustment Project sample is a completely voluntary sample, i.e., cooperation with the project is voluntary, continuing in the study is voluntary, and completion of the MIQ was voluntary. Thus, the results of the MIQ analysis for this sample should not be generalized beyond voluntary samples of similar nature.

Personal characteristics of the Work Adjustment Project sample appear in Table 7. A comparison of the disabled and the non-disabled groups shows the disabled group is somewhat younger than the non-disabled group (median age = 36 years for disabled, 40 years for non-disabled). The disabled group reported having more years of formal education than the non-disabled group (i.e., propor-

Table 8. Descriptive characteristics of two-firm sample (N = 1,348)

	Nonskilled Blue-collar		Nonskilled White-collar		Skilled White-collar		Managerial	
Characteristic	N	%	N	%	N	%	N	%
Age								
less than 30	193	37	202	63	126	36	41	26
30-44	216	41	81	25	148	43	86	55
45 and over	109	21	39	12	71	21	30	19
Education								
less than 12 years	227	43	16	5	10	3	3	2
12 years completed	236	45	235	73	154	45	9	6
12-15 years	52	10	68	21	145	42	143	91
16 years and over	6	1	3	1	33	10	1	1
Number of years in company								
1 or less	88	17	90	28	59	17	31	23
2-5	192	36	143	44	128	37	43	24
more than 5	244	47	89	28	158	46	83	53
Number of years in present job								
1 or less	103	20	99	31	40	12	18	11
2-5	201	38	136	42	140	40	47	30
more than 5	220	42	87	27	165	48	92	59
Sex								
Male	470	90	128	40	201	58	149	95
Female	54	10	193	60	144	42	8	5
Source								
Company 1	3	1	58	18	101	29	139	88
Company 2	521	99	264	82	244	70	18	12

Note: Where percentages do not total 100, the remainder represents unclassifiable data.

tionately more disabled individuals reported completing high school and having advanced degrees). The two groups were quite similar in the distribution of both sex and reported occupation. The nondisabled individuals reported having worked in their present jobs slightly longer than the disabled individuals (medians of 3.8 and 3.2 years, respectively). The typical member of the Work Adjustment Project sample can be described as male, nonskilled, high school graduate, between 36 and 40 years of age, who has been on his present job for about 3½ years.

Completed questionnaires were also obtained from 1,348 employees in two large firms in the Twin Cities area. These questionnaires were obtained as part of an employee attitude study administered by the Industrial Relations Center. Respondents from the first firm were composed primarily of white-collar employees, including both clerical workers and top-level management. Respondents from the second firm were largely in blue-collar and lower-level white-collar occupations, with a relatively small proportion of executives. Table 8 shows the occupational distribution and other descriptive characteristics of the respondents from the two firms.

Median ages for the four occupational groups were as follows: Blue-collar, 33; Nonskilled White-collar, 25; Skilled White-collar, 35; Managerial, 35. Median number of years in present job for the four groups were 4.0, 2.0, 4.8, and 7.0 respectively.

Results

For an initial analysis of the MIQ, questionnaires from both the Work Adjustment Project sample and the two-firm sample were combined, yielding a total of 2,308 questionnaires. The results presented in this section are based on this total.

Level and variability: Means and standard deviations for scores on each of the 20 MIQ scales appear in Table 9. For this group of respondents, the Security scale had the highest mean, (22.0), and Social Status the lowest (14.9). The Independence scale had the largest standard deviation (4.17), and Achievement the smallest (3.06). The majority of the mean scale scores were close to 20, while the standard deviations averaged 3.45. This meant that MIQ scale score distributions were negatively skewed, which, in turn, meant that most of the items were answered as "important" or "very import-

Table 9. Means and standard deviations on MIQ scales, for total employed sample (N = 2,308)

Scale	Mean	Standard Deviation
1. Ability Utilization	21.4	3.25
2. Achievement	21.3	3.06
3. Activity	19.4	3.25
4. Advancement	21.4	3.48
5. Authority	15.7	4.06
6. Company Policies and Practices	21.3	3.28
7. Compensation	20.3	3.24
8. Co-workers	20.4	3.15
9. Creativity	19.5	3.46
10. Independence	15.3	4.17
11. Moral Values	20.9	3.55
12. Recognition	19.3	3.63
13. Responsibility	18.9	3.17
14. Security	22.0	3.45
15. Social Service	20.0	3.39
16. Social Status	14.9	4.01
17. Supervision—Human Relations	21.5	3.28
18. Supervision—Technical	20.2	3.16
19. Variety	19.1	3.45
20. Working Conditions	21.0	3.44

ant" by the majority of respondents. A check of the item means showed that the majority were close to 4 (important).[14]

These results suggest a "response set" in the responses to the MIQ, i.e., a preference for one end of the response continuum. However, the fact that scales differ in means and standard deviations indicates that "response set" affects the scales differentially. (A later section will show that any response set which might be operating is not only different for different scales of the MIQ, but also is different for different occupational groups. Further studies reported below will show that the scores obtained on the MIQ are not, to any great extent, affected by a general response set.)

Reliability: Hoyt internal consistency reliability coefficients for each of the 20 MIQ scales are shown in the diagonal of Table 10. It will be recalled that these coefficients represent the *proportion* (or percentage) of variance which can reliably be attributed to individual differences in scores and are thus equivalent to the square of the usual correlational reliability coefficient.

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[14] Item means and standard deviations are in Appendix Table B-1.

Table 10. Reliabilities and intercorrelations of MIQ scales, for total employed sample (N = 2,308)

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Ability Utilization	**88**[a]																			
2. Achievement	81	**87**																		
3. Activity	56	61	**80**																	
4. Advancement	66	69	45	**89**																
5. Authority	22	25	34	28	**90**															
6. Company policies and practices	67	71	52	66	16	**87**														
7. Compensation	55	59	45	64	27	58	**77**													
8. Co-workers	56	63	53	48	20	61	49	**84**												
9. Creativity	60	64	53	54	48	50	45	44	**87**											
10. Independence	14	19	35	12	37	12	24	19	33	**87**										
11. Moral Values	59	62	48	47	11	61	42	53	43	12	**84**									
12. Recognition	47	60	43	54	37	50	59	44	48	30	35	**88**								
13. Responsibility	57	62	55	55	64	48	45	41	76	36	42	52	**78**							
14. Security	60	64	47	61	12	67	59	60	40	15	55	45	38	**89**						
15. Social Service	61	68	57	47	30	55	39	64	57	21	57	39	53	49	**91**					
16. Social Status	16	20	31	23	61	13	32	23	34	41	08	42	45	12	23	**85**				
17. Supervision—Human Relations	66	70	54	63	20	78	58	65	50	18	59	52	48	66	55	18	**84**			
18. Supervision—Technical	60	67	56	60	28	69	58	66	50	26	56	54	51	61	55	28	77	**78**		
19. Variety	55	56	57	47	30	45	47	43	62	33	38	43	57	41	46	31	46	47	**82**	
20. Working Conditions	60	62	46	55	08	67	58	62	39	17	52	43	35	67	49	12	63	60	39	**88**

Note: Decimal points omitted.

[a] Bold-face number in diagonal is proportion of total variance that is reliable (Hoyt analysis-of-variance reliability coefficient).

The Hoyt reliability coefficients listed in Table 10 indicate that all of the MIQ scales had high reliabilities. The Compensation scale was least reliable, with 77% of its variance found to be reliable, or 23% of total score variance attributable to error. (Yet this scale was more reliable than the most reliable scale of the NFQ.) The most reliable scale was Social Service, with 91% reliable variance, or only 9% attributable to error. Median reliability was .87. Only four scales had Hoyt reliability coefficients of less than .81 (a correlational reliability of .90). These scales were Compensation (.77), Responsibility and Supervision—Technical (both .78), and Activity (.80). Yet even these four scales exceeded the traditional acceptable reliability minimum of r = .80 (or 64% reliable variance).

Covariation: Scale intercorrelations are also shown in Table 10. All scales were positively intercorrelated for this group of workers. The two most highly correlated scales were Achievement and Ability Utilization (r = .81). The lowest correlations were .08, between Social Status and Moral Values, and between Working Conditions and Authority. Median correlation between scales was .50. About one-fourth of the correlations were .60 or higher.

The MIQ scale intercorrelations were generally somewhat higher than was desired. However, these intercorrelations should be considered in relation to the scale reliabilities, since the theoretical upper limit of correlation between scales is the lower reliability in the pair of scales under consideration. Thus while the scale intercorrelations were higher than usual (and therefore the common variance was a larger-than-usual proportion of total variance), the high reliabilities of the scales allowed for a sufficient amount of specific variance to be used in the measurement of independent dimensions.

Factorial composition: A factor analysis of the MIQ scale intercorrelations yielded two factors. Factor I, constituting 69% of the common variance, seemed to be a general factor, with all but three scales having significant (.40 or higher) loadings on it. The scales loading highest on Factor I, and therefore defining it, were Company Policies and Practices, Achievement, Supervision—Human Relations, Ability Utilization, Security, Working Conditions, and Supervision—Technical. Factor II was defined by the three scales not loading on Factor I (Authority, Independence, and Social Status) and by Responsibility, Creativity, and Variety (See Table 11).

Table 11. Varimax factor matrix of MIQ scales, for total employed sample (N = 2,308)

Variable	Factor I	Factor II	Communality	SMC[a]
1. Ability Utilization	**.78**	.25	.68	.71
2. Achievement	**.83**	.31	.78	.80
3. Activity	.56	.44	.51	.53
4. Advancement	**.71**	.29	.58	.64
5. Authority	.04	**.78**	.62	.58
6. Company policies and practices	**.85**	.13	.73	.72
7. Compensation	**.64**	.32	.51	.58
8. Co-workers	**.72**	.20	.57	.62
9. Creativity	.50	**.61**	.62	.67
10. Independence	.09	**.51**	.27	.29
11. Moral Values	.70	.11	.50	.51
12. Recognition	.50	.46	.47	.52
13. Responsibility	.44	**.73**	.73	.74
14. Security	**.78**	.09	.62	.61
15. Social Service	**.64**	.33	.52	.61
16. Social Status	.05	**.68**	.46	.47
17. Supervision—Human Relations	**.83**	.18	.72	.74
18. Supervision—Technical	**.75**	.29	.65	.68
19. Variety	.48	**.51**	.48	.51
20. Working Conditions	**.77**	.07	.59	.60
Contribution of Factor	8.04	3.56	11.60	
Proportion of Common Variance	.69	.31	1.00	

[a] Estimated communalities: Squared multiple correlation coefficients.

The pattern of loadings suggests that Factor I represented a general vocational need dimension with reference to reinforcers usually found in the work setting. Factor II, more difficult to interpret, probably represented a status need dimension and had reference to reinforcers which accompany a high position in society.

It is of interest to note, in connection with the finding on scale intercorrelations, that the median communality or common variance as shown in Table 11 was .57. The median scale reliability being .87, an average of about .30 of the total variance in scale scores was therefore reliable specific variance, uniquely measuring some dimensions not measured by other scales.

Evaluation

The foregoing analysis indicates: (1) the MIQ scales were highly reliable; (2) while scale score distributions were negatively skewed, there was enough score variation to allow reliable measurement;

(3) many scales were relatively independent of the other scales, although not to the extent that the NFQ scales were independent.

In comparison with the NFQ, the MIQ was a much more reliable instrument and measured several more dimensions. While the MIQ scales were not as independent of each other as the NFQ scales, their high reliabilities compensated for this deficiency by allowing for more specific variance. Furthermore, MIQ scale score distributions showed more variability. It was therefore felt that the MIQ merited further development.

Studies on the Minnesota Importance Questionnaire

The studies reported in this section focused on two questions. The first was whether measurements by the MIQ were stable over time. The second, and perhaps more important, question was whether the MIQ scales were capable of discriminating between various occupational groups. If scale scores were found to be the same for different occupations, the utility and validity of the questionnaire could be questioned, since different occupational groups would be expected to differ on at least some of the MIQ scales.

The following studies were carried out to answer these questions: (1) test-retest reliability studies; (2) disability status differences; (3) occupational status differences; (4) employment status differences.

Test-retest reliabilities

The MIQ was administered to three groups of college students from a course in introductory psychology at the University of Minnesota.[15] These groups were re-tested after three time intervals: ten days, three weeks, and six weeks. The students were motivated to participate in the study by the addition of points to their test score totals in Psychology 1.

Test-retest ANOVA coefficients[16] for the three groups are shown in Table 12. These coefficients may be interpreted as representing the proportion of reliable (i.e., stable) variance left after subtracting the variance effects due to time. The data in Table 12 show that measurement on the MIQ was relatively reliable (stable) for the college student subjects. Median test-retest coefficient for the ten-day group was .80, with a range of .64 to .88; .86, with a range of .78 to .89 for the three-week group; and .77, with a range of .70 to .86 for the six-week group.

Twelve of the scales showed a pattern of being more reliable for the three-week group than for the ten-day or six-week groups. These were: Ability Utilization, Achievement, Activity, Authority, Company Policies and Practices, Compensation, Co-workers, Creativity, Recognition, Supervision—Human Relations, Supervision—Techni-

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[15] Descriptive characteristics of the total college student group appear in the section on employment status differences, p. 32.

[16] Computed from a two-way analysis of variance without replication, with time (test, retest) as one classification and people as the other classification. Scale scores are the observations.

Table 12. Test-retest reliability[a] of MIQ scales at three time intervals, for college sophomores

Scale	Time Interval 10 days (N = 168)	 3 weeks (N = 92)	 6 weeks (N = 189)
1. Ability Utilization	.64	.82	.73
2. Achievement	.67	.78	.76
3. Activity	.82	.89	.74
4. Advancement	.73	.78	.81
5. Authority	.82	.88	.80
6. Company policies and practices	.76	.88	.84
7. Compensation	.79	.85	.77
8. Co-workers	.82	.87	.74
9. Creativity	.79	.86	.80
10. Independence	.81	.79	.70
11. Moral Values	.83	.86	.85
12. Recognition	.75	.88	.72
13. Responsibility	.73	.82	.85
14. Security	.85	.88	.86
15. Social Service	.88	.86	.81
16. Social Status	.87	.87	.85
17. Supervision—Human Relations	.75	.82	.75
18. Supervision—Technical	.81	.87	.73
19. Variety	.76	.83	.77
20. Working Conditions	.88	.86	.76

[a] ANOVA reliability coefficients representing proportion of total variance not affected by time.

cal, and Variety. Moral Values, Security and Social Status remained more or less at the same high reliability levels. Advancement and Responsibility showed a pattern of increase in reliability with time; while Independence, Social Service, and Working Conditions decreased in reliability with time.

Since college students generally have had little employment experience, and thus little experience with work-oriented reinforcers, one would expect their response to the MIQ to be less stable than that of a group of employed persons. One would expect to find at least as high test-retest reliability for the MIQ in the study of employed persons.

Disability status differences

To study the effect of physical or mental disability on the measurement of vocational needs, MIQ scores for a disabled group (N = 507) were compared with those of a non-disabled group

(N = 453). These groups were part of the Work Adjustment Project sample (described on pages 22-24). It will be recalled that these groups were similar in age, sex, education and occupational distribution. Thus, any MIQ score differences obtained between the two groups would more likely be a function of disability status than of these other variables.

Level: Mean scores on each MIQ scale for the disabled and non-disabled groups are presented in Table 13. In general, the two groups obtained similar mean scores. However, a one-way analysis of variance[17] indicates that the two groups differed significantly in level on 10 of the 20 scales. On nine of these ten scales, the mean of the non-disabled group was the significantly higher mean. These scales were: Achievement, Advancement, Company Policies and Practices, Co-workers, Moral Values, Security, Social Service, and the two Supervision scales.

Table 13. MIQ scale means, for disabled and non-disabled groups

Scale	Group			
	Disabled (N = 507)	Non-Disabled (N = 453)	F(1,958)	p[a]
1. Ability Utilization	20.6	21.0	2.90	
2. Achievement	20.4	21.0	6.33	.05
3. Activity	18.1	18.4	1.49	
4. Advancement	20.4	21.0	5.38	.05
5. Authority	14.7	14.4	1.50	
6. Company Policies and Practices	20.2	20.9	8.56	.01
7. Compensation	19.1	19.5	2.72	
8. Co-workers	19.3	19.9	6.56	.05
9. Creativity	18.5	18.8	1.06	
10. Independence	14.5	13.8	6.59	.05
11. Moral Values	19.9	20.8	11.80	.001
12. Recognition	18.2	18.4	0.66	
13. Responsibility	18.0	18.0	0.01	
14. Security	21.0	21.6	4.40	.05
15. Social Service	19.2	19.8	4.64	.05
16. Social Status	13.7	13.3	2.59	
17. Supervision—Human Relations	20.1	21.0	10.69	.01
18. Supervision—Technical	18.9	19.4	5.13	.05
19. Variety	18.0	18.3	1.36	
20. Working Conditions	20.1	20.5	3.14	

[a] Probability of error in rejecting null hypothesis of no difference between group means, if ≤ .05.

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[17] For comparison of two groups, the results are equivalent to using a t-test.

The one scale on which the mean score was significantly higher for the disabled group was the Independence scale. Table 13 further shows that mean scores on Authority and Social Status were also higher for the disabled group than for the non-disabled, although for these two scales the mean differences were not statistically significant. It should be noted, however, that only on these three scales were the disabled group mean scores higher than those of the non-disabled group.

Viewing these results in the context of the factor analysis reported in pages 27-28, one may infer that "status" needs (Independence, Authority, Social Status) are stronger for the disabled than for the non-disabled, i.e., these constitute more preferred reinforcers for the disabled. Similarly, the usual reinforcers found at work may not operate as effectively for the disabled as for the non-disabled.

Variability: The variability of scale scores for a group indicates the consistency, for that group, of preference for the reinforcer represented by the scale. Thus, difference in score variability is a clue to the relative effectiveness of a reinforcer for one group as contrasted with another.

Scale score variances for the disabled and non-disabled groups are presented in Table 14. The table shows that, on 19 scales, the variances for the disabled group are larger than the variances for the non-disabled group.[18] On 15 of the 20 scales, these variance differences were found to be statistically significant ($p \leq .05$) by means of Bartlett's test of homogeneity of variance.[19] The five nonsignificant variance differences were on the Authority, Independence, Recognition, Social Status and Variety scales. Referring again to the factor analysis shown in pages 27-28, it is interesting to note that

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[18] It will be noted by some readers that differences between variances and differences between means are both significant for several scales. Since equality of group variances is an assumption underlying the analysis of variance test on group means, significance of the test of mean differences might be questioned where variances have been found to be significantly different. This concern for the assumptions underlying the analysis of variance is an important one. However, evidence concerning the assumption of homoscedasticity (equality of variances) in the use of the ANOVA technique indicates that the technique is sufficiently "robust" so that the assumption can be violated with little loss in accuracy of inference about the comparison of means. The interested reader is referred to Scheffé, H. *The analysis of variance*, New York: Wiley, 1959; Chapter 10: The effects of departures from the underlying assumptions.

[19] McNemar, Q. *Psychological statistics*. 3rd ed. New York: Wiley, 1962, pp. 249-250.

Table 14. MIQ scale variances, for disabled and non-disabled groups

Scale	Group			
	Disabled (N = 507)	Non-Disabled (N = 453)	Chi-square[a]	p[b]
1. Ability Utilization	18.77	11.84	24.88	.001
2. Achievement	17.58	10.49	31.18	.001
3. Activity	14.24	11.69	4.63	.05
4. Advancement	18.52	13.10	14.10	.001
5. Authority	17.09	17.82	0.21	
6. Company policies and practices	18.51	11.88	23.04	.001
7. Compensation	14.67	11.36	7.73	.01
8. Co-workers	14.15	10.98	7.59	.01
9. Creativity	17.87	14.14	6.48	.02
10. Independence	17.71	16.84	0.30	
11. Moral Values	20.83	14.37	16.27	.001
12. Recognition	16.31	15.74	0.15	
13. Responsibility	13.94	11.09	6.19	.02
14. Security	21.70	14.52	18.97	.001
15. Social Service	17.67	14.66	4.15	.05
16. Social Status	16.17	15.44	0.26	
17. Supervision—Human Relations	17.93	11.40	24.05	.001
18. Supervision—Technical	14.02	10.60	9.28	.01
19. Variety	15.96	14.20	1.63	
20. Working Conditions	18.80	14.00	10.25	.01

[a] Chi-square value for Bartlett's test of homogeneity of variance with 1 degree of freedom.

[b] Probability of error in rejecting null hypothesis of no difference between group variances, if $\leq .05$.

these five scales loaded substantially on the second factor, the "status" need.

These results indicate that disability is a significant factor affecting MIQ scores. Scores for the disabled group were more variable than those of the non-disabled group. Whether or not this finding is, in fact, the *result* of being disabled can not be answered in this cross-sectional study. This question requires a longitudinal study of a sample of individuals who initially are not disabled and later become disabled.

Rank Differences: In a further attempt to study the characteristics of response to the MIQ by disabled and non-disabled individuals, the following procedure was used: For each person, scale scores were ranked in descending order of magnitude. The scale with the highest score received a rank of 1, the next highest a rank of 2, and so on, until all 20 scales received ranks. Then the mean and variance of the ranks for each scale were computed for the disabled and non-disabled groups separately. Group differences in these means and variances were then tested for statistical significance, to determine whether level and variability in relative importance of a scale differed between disabled and non-disabled individuals.

Comparison of mean scale ranks, listed in Table 15, shows that the disabled and non-disabled groups assigned similar ranks to each scale. For both groups, Security was given the highest mean rank, and Social Status the lowest. Mean rank differences between disabled and non-disabled groups were statistically significant on only five of the twenty scales. These scales were: Independence (mean rank of 16 for the disabled group and 17 for the non-disabled); Moral Values (9 and 8 respectively); Responsibility (12 and 13); Social Status (17 and 18); and Supervision—Human Relations (8 and 7). There is, then, a basic similarity between disabled and non-disabled groups in the ranking of importance of these twenty reinforcement aspects of the work environment.

To determine whether consistency in ranking differed between the two groups, the variances of the ranks for each scale were com-

Table 15. Mean ipsative ranks of MIQ scales, for disabled and non-disabled groups

	Group			
Scale	Disabled (N = 507)	Non-Disabled (N = 453)	F(1,958)	p[a]
1. Ability Utilization	6.9	6.9	0.00	
2. Achievement	7.2	6.9	1.49	
3. Activity	12.3	12.5	0.46	
4. Advancement	7.3	7.0	1.08	
5. Authority	16.3	16.7	1.59	
6. Company policies and practices	7.8	7.4	2.12	
7. Compensation	10.1	10.2	0.12	
8. Co-workers	10.0	9.6	1.93	
9. Creativity	11.1	11.5	1.90	
10. Independence	16.3	17.4	15.27	.001
11. Moral Values	8.6	7.8	4.35	.05
12. Recognition	11.9	11.9	0.00	
13. Responsibility	12.4	13.2	9.96	.01
14. Security	6.0	5.6	1.57	
15. Social Service	9.9	9.5	1.21	
16. Social Status	17.2	17.9	6.91	.01
17. Supervision—Human Relations	7.8	7.1	5.72	.05
18. Supervision—Technical	11.0	10.8	0.88	
19. Variety	12.1	12.2	0.02	
20. Working Conditions	7.8	7.9	0.12	

[a] Probability of error in rejecting null hypothesis of no difference in mean ranks, if $p \leq .05$.

pared by means of Bartlett's test. These results are shown in Table 16. Significant differences in variability were found on all five scales for which mean ranks were significantly different: Independence, Moral Values, Responsibility, Social Status, and Supervision—Human Relations. On these five scales, the disabled group was significantly more variable than the non-disabled group. This finding is consistent with the previous finding of greater variability in scale scores for the disabled when compared with the non-disabled.

Table 16. Variance of ipsative ranks of MIQ scales, for disabled and non-disabled groups

Scale	Group Disabled (N = 507)	 Non-Disabled (N = 453)	Chi-square[a]	p[b]
1. Ability Utilization	17.71	15.38	2.35	
2. Achievement	14.11	12.50	1.75	
3. Activity	20.00	17.16	2.81	
4. Advancement	21.83	20.45	0.51	
5. Authority	20.79	17.47	3.61	
6. Company policies and practices	21.10	17.96	3.09	
7. Compensation	20.82	21.86	0.29	
8. Co-workers	20.76	20.63	0.00	
9. Creativity	21.90	20.56	0.47	
10. Independence	22.64	14.09	26.37	.001
11. Moral Values	35.33	27.62	7.16	.01
12. Recognition	22.48	22.33	0.01	
13. Responsibility	16.36	14.77	1.24	
14. Security	25.90	19.76	8.64	.01
15. Social Service	22.61	22.14	0.05	
16. Social Status	20.30	12.23	29.99	.001
17. Supervision—Human Relations	19.53	16.30	3.88	.05
18. Supervision—Technical	17.82	17.38	0.08	
19. Variety	22.88	23.75	0.16	
20. Working Conditions	22.94	22.89	0.00	

[a] Chi-square value of Bartlett's test of homogeneity of variance with 1 degree of freedom.

[b] Probability of error in rejecting null hypothesis of no difference between group variances, if $p \leq .05$.

Factorial Composition: Scale intercorrelations for the disabled and non-disabled groups were factor-analyzed separately to see if the same underlying dimensions would account for scale covariation in both groups.[20] Table 17 compares the results of these two factor analyses.

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[20] Intercorrelation matrices appear in Appendix B, Tables B-2 and B-3.

Table 17. Varimax factor matrices of MIQ scales, for disabled and non-disabled groups

Variable	Disabled				Non-Disabled			
	Factor I	Factor II	Communality	SMC[a]	Factor I	Factor II	Communality	SMC[a]
1. Ability Utilization	**88**	14	80	83	**78**	32	71	75
2. Achievement	**91**	22	88	90	**81**	36	79	80
3. Activity	**64**	33	52	56	53	48	52	53
4. Advancement	**80**	24	70	76	**72**	29	61	67
5. Authority	06	**77**	59	56	02	**74**	54	55
6. Company policies and practices	**88**	08	79	79	**87**	11	78	77
7. Compensation	**74**	29	63	73	**61**	35	50	60
8. Co-workers	**78**	16	63	68	**76**	20	63	68
9. Creativity	64	55	70	75	50	61	62	68
10. Independence	08	**48**	24	25	10	**50**	26	27
11. Moral Values	**76**	−00	57	60	**72**	09	52	55
12. Recognition	61	40	53	61	49	47	46	53
13. Responsibility	55	**68**	76	77	42	**73**	72	73
14. Security	**84**	04	72	74	**78**	13	62	65
15. Social Service	**77**	20	63	70	**64**	34	53	63
16. Social Status	−05	**69**	48	48	03	**65**	42	45
17. Supervision—Human Relations	**89**	09	79	82	**85**	21	77	78
18. Supervision—Technical	**85**	15	74	78	**73**	26	60	65
19. Variety	60	43	54	61	38	**58**	49	52
20. Working Conditions	**84**	07	72	74	**79**	10	63	64
Contribution of factor	10.17	2.82	12.99		8.03	3.66	11.69	
Proportion of common variance	.78	.22	1.00		.69	.31	1.00	

Note: Decimal points omitted.

[a] Estimated communalities: squared multiple correlation coefficients.

Table 17 shows that the factor structures for the disabled and non-disabled groups were basically similar. Each factor analysis yielded two factors. Factor I accounted for 78% of the common variance for the disabled group, compared with 69% for the non-disabled group. This factor was defined in both groups by Ability Utilization, Achievement, Advancement, Company Policies and Practices, Compensation, Co-workers, Moral Values, Security, Social Service, the two Supervision scales, and Working Conditions. Factor II, for both groups, was defined by Authority, Social Status, Responsibility and Independence.

Some minor differences were observed. The Activity and Recognition scales loaded principally on Factor I for the disabled group, but almost equally on Factors I and II for the non-disabled group. The Variety scale loaded on Factor I for the disabled group and on Factor II for the non-disabled group. The Creativity scale loaded almost equally on both factors, a bit higher on Factor I for the disabled group and a bit higher on Factor II for the non-disabled group.

In general, however, the factor structures obtained for the two groups were similar, not only to each other, but also to the factor structure for the total employed sample of 2,308. (See Table 11.)

Reliability: The results reported thus far show some statistically significant level, variability, and rank differences between disabled and non-disabled groups. However, these differences are small. One might question whether these relatively small differences are practically significant in addition to being statistically significant. From one viewpoint, obtained differences are practically significant if the scale reliabilities are sufficiently high to make these differences *reliable* group differences. If scale reliabilities are low, the discrimination between groups is relatively poor, even for statistically significant differences, since observed scores can be several points above or below the true scores. Thus, it seemed advisable to examine the reliability of each scale, for the disabled and non-disabled groups separately.

Table 18 shows that the MIQ scales had high reliabilities for both groups. The lowest Hoyt reliability coefficient was .77, the highest .93. (A Hoyt reliability coefficient of .77 is equivalent to a correlational reliability of .88, which is well above the usually accepted coefficient of $r = .80$.) Median Hoyt reliability coefficient was .89 for the disabled group and .88 for the non-disabled group.

Table 18. Reliability[a] of MIQ scales, for disabled and non-disabled groups

Scale	Group	
	Disabled	Non-Disabled
1. Ability Utilization	.92	.90
2. Achievement	.92	.88
3. Activity	.81	.81
4. Advancement	.92	.91
5. Authority	.90	.91
6. Company policies and practices	.92	.89
7. Compensation	.81	.77
8. Co-workers	.87	.85
9. Creativity	.90	.88
10. Independence	.86	.88
11. Moral Values	.87	.86
12. Recognition	.88	.90
13. Responsibility	.82	.78
14. Security	.93	.91
15. Social Service	.93	.93
16. Social Status	.84	.85
17. Supervision—Human Relations	.90	.86
18. Supervision—Technical	.82	.77
19. Variety	.86	.85
20. Working Conditions	.91	.89

[a] Indicated by Hoyt analysis-of-variance reliability representing proportion of total variance that is reliable.

A comparison of the reliabilities for the two groups shows that the disabled group was generally more internally consistent than the non-disabled group, although differences were small. For the disabled group, all the Hoyt coefficients were .81 or above ($r = .90$). For the non-disabled group, the Hoyt coefficients for the Compensation, Responsibility and Supervision—Technical scales fell below .80.

In view of the above findings, it may be concluded that the differences observed between disabled and non-disabled appear to be *reliable* group differences and not due to the unreliability of the scales.

Summary: Analysis of data for disabled and non-disabled groups indicates that response to the MIQ was apparently affected by the presence or absence of disability. Disabled individuals gave slightly more reliable responses to the questionnaire, but their scores were more variable than those of non-disabled individuals. Disabled individuals tended to give a slightly different ranking of needs. Again, they were less consistent in their rankings than were the non-disabled individuals. It appears, then, that disability status has some relevance to vocational needs.

Occupational status differences

The study of occupational differences in MIQ scale scores was carried out to infer validity for the MIQ. Reinforcers vary from occupation to occupation. Thus, certain occupations may satisfy only the "bread-and-butter" needs, such as compensation, good working conditions and good supervision. These occupations are likely to be at the bottom of the occupational hierarchy. Other occupations satisfy a larger range of needs. Professional occupations, for instance, would be expected to satisfy such needs as creativity, achievement, and social service.

The *Theory of Work Adjustment* states that an individual's need set and the reinforcer system of the job interact to produce job satisfaction. It hypothesizes that satisfaction is an intervening variable which motivates the individual to leave the job, if satisfaction is sufficiently low. Dissatisfaction is the outcome of a lack of correspondence between the individual's need set and the reinforcers available on the job. In dissatisfaction, the individual's need is greater than the amount of reinforcement in the job.

This line of reasoning leads to the following expectations. If dissatisfaction leads to withdrawal from the dissatisfying situation, and if dissatisfaction results from need-reinforcement discrepancy, then scores on a given MIQ scale would vary less for individuals in occupations in which the pertinent reinforcers are usually found, in contrast to those in occupations in which the pertinent reinforcers are not found. Less variability in scores would result from the "natural selection" which occurs when dissatisfied individuals (who have high-strength needs not being met by the occupation) leave the occupation to find other employment which is more consistent with their need pattern. Following a similar line of reasoning, mean scores on a given MIQ scale would be higher for persons in occupations in which the appropriate reinforcers are usually found, since those with high-strength needs would be attracted to the occupation as a potentially reinforcing environment. Therefore, a reinforcer which is characteristic of a given occupation would be identified by a combination of a high mean and low variability in scores on the pertinent MIQ scale for the individuals working in that occupation.

If these hypotheses concerning occupational differences are not refuted by the data, it would seem that some validity can be ascribed to both the MIQ and the *Theory of Work-Adjustment*. (Other

Table 19. MIQ scale means, for four occupational groups

Scale	Group				F(3,1344)	p*
	Nonskilled blue-collar	Nonskilled white-collar	Skilled white-collar	Managerial		
1. Ability Utilization	20.9	22.0	22.3	22.6	32.23	.001
2. Achievement	21.1	21.9	22.0	22.2	18.48	.001
3. Activity	19.6	20.6	20.4	20.1	10.19	.001
4. Advancement	20.8	22.2	22.6	22.8	37.43	.001
5. Authority	16.0	15.7	16.8	18.2	19.78	.001
6. Company policies and practices	21.4	22.0	22.4	22.2	11.34	.001
7. Compensation	20.6	21.2	21.2	21.3	6.03	.001
8. Co-workers	21.0	21.5	20.9	19.6	19.58	.001
9. Creativity	19.4	19.6	20.6	21.6	31.91	.001
10. Independence	16.2	16.3	16.3	14.7	7.22	.001
11. Moral Values	20.9	21.8	21.8	21.2	10.12	.001
12. Recognition	19.7	20.3	20.2	20.5	4.59	.01
13. Responsibility	18.8	19.3	20.0	21.0	30.14	.001
14. Security	22.7	22.6	22.8	21.0	20.61	.001
15. Social Service	20.0	20.7	21.0	19.8	12.16	.001
16. Social Status	16.1	15.7	15.4	16.2	2.76	.05
17. Supervision—Human Relations	21.9	22.2	22.4	22.0	2.68	.05
18. Supervision—Technical	20.8	21.2	21.3	20.6	4.71	.01
19. Variety	19.1	19.8	20.0	20.7	16.51	.001
20. Working Conditions	21.6	21.9	21.8	20.1	16.31	.001

* Probability of error in rejecting null hypothesis of no difference among means.

relevant hypotheses concerning MIQ scores in relation to occupation are discussed in pp. 51-52.)

The following analyses are based on data for the two-firm sample. (See pp. 23-24 for description of this sample.)

Level: Table 19 presents the mean scale scores of four occupational groups for each of the 20 MIQ scales. The four occupational groups studied were: nonskilled blue-collar (N = 524), nonskilled white-collar (N = 322), skilled white-collar (N = 345) and managerial (N = 157).

A one-way analysis of variance showed that the four groups differed significantly in mean scores on every scale. The managerial group had the highest mean on ten scales: Ability Utilization, Achievement, Advancement, Authority, Compensation, Creativity, Recognition, Responsibility, Social Status and Variety. The skilled white-collar group had the highest mean on the following scales: Company Policies and Practices, Security, Social Service, Supervision—Human Relations, and Supervision—Technical. The highest mean on Activity, Co-workers, and Working Conditions belonged to the nonskilled white-collar group. Furthermore, the two white-collar groups obtained the highest mean on the Independence and Moral Values scales. The nonskilled blue-collar group generally scored lowest, except on the Independence, Security, Social Status, and Working Conditions scales, where its means were a few decimal points less than the highest means.

Variability: The data on scale variances for the four occupational groups are shown in Table 20. Bartlett's test of homogeneity of variance showed that the four groups differed significantly in scale variance on all but four scales: Authority, Independence, Social Status and Social Service. It is worth noting that the first three scales (a) had the largest variances; (b) had the lowest means (see Table 19); and (c) defined the "status" factor shown in Table 11 and discussed in pages 27-28.

The smallest variance among the groups was obtained by the managerial group on 12 of the 16 remaining scales: Ability Utilization, Achievement, Activity, Advancement, Company Policies and Practices, Compensation, Creativity, Recognition, Responsibility, Supervision—Human Relations, Supervision—Technical, and Variety. The skilled white-collar group had the smallest variance on Co-workers, Security, and Working Conditions. On Moral Values, the

Table 20. MIQ scale variances, for four occupational groups

Scale	Group				Chi-square[a]	p[b]
	Nonskilled blue-collar	Nonskilled white-collar	Skilled white-collar	Managerial		
1. Ability Utilization	7.78	6.35	4.96	4.04	34.93	.001
2. Achievement	6.37	4.86	4.53	3.56	25.16	.001
3. Activity	9.35	5.60	6.36	5.45	36.91	.001
4. Advancement	11.75	6.76	5.53	4.61	88.93	.001
5. Authority	13.64	14.28	14.51	11.61	2.86	
6. Company policies and practices	7.95	5.54	5.65	4.70	25.79	.001
7. Compensation	7.51	8.66	7.04	4.99	15.32	.01
8. Co-workers	7.89	6.92	5.26	6.78	16.50	.001
9. Creativity	9.31	7.73	6.44	4.39	35.70	.001
10. Independence	15.99	15.36	15.81	16.40	0.85	
11. Moral Values	8.53	6.65	7.87	10.81	13.78	.01
12. Recognition	11.38	9.56	8.69	6.39	20.89	.001
13. Responsibility	8.36	6.36	5.82	4.64	26.71	.001
14. Security	6.82	7.09	5.02	6.91	12.58	.01
15. Social Service	8.03	7.47	6.29	8.53	7.64	
16. Social Status	13.91	15.61	13.16	12.72	3.31	
17. Supervision—Human Relations	9.29	5.44	5.39	3.33	75.73	.001
18. Supervision—Technical	8.48	5.92	5.48	4.91	31.38	.001
19. Variety	10.38	8.22	7.05	4.80	38.04	.001
20. Working Conditions	7.37	7.74	6.58	10.08	10.53	.02

[a] Chi-square value of Bartlett's test of homogeneity of variance, with 3 degrees of freedom.

[b] Probability of error in rejecting null hypothesis of no difference between group variances, if $p \leq .05$.

smallest variance was obtained by the nonskilled white-collar group. The nonskilled blue-collar group generally obtained the largest variance on most scales.

Using the criterion of a high mean and low variability to identify reinforcers characteristic of a given occupation, the data indicate that Ability Utilization, Achievement, Advancement, Compensation, Creativity, Recognition, Responsibility, and Variety are reinforcer dimensions relatively more characteristic of the managerial occupation than of the other three.[21] Security as a reinforcer is relatively more characteristic of skilled white-collar occupations, and Moral Values, of the nonskilled white-collar occupations. In addition, there is some suggestion that Activity is a characteristic reinforcer for the nonskilled white-collar employees, Company Policies and Practices for the managerial group, and Working Conditions for the skilled white-collar employees.

Ranks: Further study of occupational group differences in MIQ scores was undertaken by means of a ranking analysis similar to that carried out in the disability status section. Ranks were assigned to each individual's scale scores. The mean and variance of ranks on each scale were calculated for each occupational group. These are listed in Tables 21 and 22.

Table 21 shows that Security was ranked highest by all three non-managerial groups, while the managerial group gave Advancement first rank. Supervision—Human Relations and Company Policies and Practices were given high ranks by all four groups. Advancement and Ability Utilization were ranked in the top five by all groups except the nonskilled blue-collar. The latter ranked Working Conditions and Achievement higher than Advancement and Ability Utilization. All groups ranked Authority, Independence and Social Status as least important.

In terms of variability in ranks, Table 22 shows that Social Status was the least variable scale, and Achievement and Authority among the least variable scales, for all four groups. In contrast,

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[21] In any scale with an upper limiting value (score), a high mean is associated with lower variability (relative to variability possible when the mean has a lower value). This psychometric artifact may account for some findings which meet the high-mean-low-variability criterion. The higher the absolute value of the mean in the finding, the more susceptible the finding is to interpretation as a psychometric artifact. Conversely, the closer the mean value is to the midpoint of the scale, the less likely that the finding is a psychometric artifact.

Table 21. Mean ipsative ranks of MIQ scales, for four occupational groups

Scale	Group					
	Nonskilled blue-collar	Nonskilled white-collar	Skilled white-collar	Managerial	F(3,1344)	p*
1. Ability Utilization	8.8	7.4	6.9	5.8	28.21	.001
2. Achievement	8.2	7.7	7.6	6.7	7.59	.001
3. Activity	11.7	11.2	12.1	12.6	4.34	.01
4. Advancement	8.7	6.8	6.2	5.4	30.42	.001
5. Authority	17.1	17.9	16.6	14.8	28.40	.001
6. Company policies and practices	7.6	7.6	7.0	6.9	2.62	.05
7. Compensation	9.6	9.2	9.8	9.5	1.01	
8. Co-workers	8.4	8.7	10.7	12.6	47.16	.001
9. Creativity	11.8	12.8	11.1	8.4	39.86	.001
10. Independence	16.4	17.1	17.3	18.5	11.82	.001
11. Moral Values	8.9	7.9	8.3	8.6	2.73	.05
12. Recognition	11.1	11.1	11.8	11.1	1.76	
13. Responsibility	13.6	13.9	12.6	10.2	40.53	.001
14. Security	4.7	5.9	5.9	9.6	55.31	.001
15. Social Service	10.8	10.4	10.4	12.3	7.82	.001
16. Social Status	17.0	17.8	18.2	17.5	11.53	.001
17. Supervision—Human Relations	6.3	6.8	6.7	7.1	2.13	
18. Supervision—Technical	9.1	9.4	9.7	10.8	6.40	.001
19. Variety	12.8	12.6	12.4	10.6	9.81	.001
20. Working Conditions	7.4	7.7	8.5	11.1	26.40	.001

* Probability of error in rejecting null hypothesis of no difference in mean rank, if p ≤ .05.

Table 22. Variance of ipsative ranks of MIQ scales, for four occupational groups

Scale	Group				Chi-square[a]	p[b]
	Nonskilled blue-collar	Nonskilled white-collar	Skilled white-collar	Managerial		
1. Ability Utilization	19.81	17.15	14.50	13.52	14.36	.01
2. Achievement	13.05	10.33	11.98	12.53	5.45	
3. Activity	20.48	18.73	19.11	20.38	1.05	
4. Advancement	27.61	18.69	18.18	17.16	28.88	.001
5. Authority	14.60	8.44	15.54	18.70	44.50	.001
6. Company policies and practices	18.70	17.06	17.97	20.73	2.21	
7. Compensation	22.65	23.41	26.16	23.45	2.28	
8. Co-workers	21.28	21.33	19.92	18.28	1.74	
9. Creativity	19.74	16.17	17.94	18.41	3.98	
10. Independence	20.98	15.24	14.46	9.02	43.66	.001
11. Moral Values	23.27	22.28	26.44	30.54	7.14	
12. Recognition	26.61	22.44	21.38	20.72	7.19	
13. Responsibility	14.60	10.78	16.45	16.62	17.13	.001
14. Security	14.81	17.25	18.43	27.51	25.82	.001
15. Social Service	18.83	19.20	19.50	20.42	0.43	
16. Social Status	11.74	8.00	7.36	8.37	28.35	.001
17. Supervision—Human Relations	19.27	16.28	16.60	13.82	7.66	
18. Supervision—Technical	21.26	18.86	17.84	19.36	3.51	
19. Variety	23.47	20.04	19.59	21.00	4.30	
20. Working Conditions	20.74	22.30	25.26	27.74	7.32	

[a] Chi-square value of Bartlett's test of homogeneity of variance, with 3 degrees of freedom.

[b] Probability of error in rejecting null hypothesis of no difference between variances of ranks, if $p \leq .05$.

Moral Values and Compensation were among the most variable scales for all four groups.

A one-way analysis of variance showed that the four groups differed significantly in the mean ranks assigned to seventeen of the twenty MIQ scales. This means that some groups considered these reinforcer dimensions as *relatively* more important (in relation to other reinforcer dimensions) than did other groups. Thus, Ability Utilization, Achievement, Advancement, Authority, Company Policies and Practices, Creativity, Responsibility, and Variety were accorded higher average ranks by the managerial group than by the other groups. Similarly, Social Service was given a higher rank by both white-collar groups. In addition, the nonskilled white-collar group gave higher ranks to Activity and Moral Values. The nonskilled blue-collar workers ranked Co-workers, Independence, Security, Social Status, Supervision—Technical and Working Conditions higher than did the other groups. These results are similar to those shown in Table 19, the differences between the two tables being due to unreliability in ranking means from negatively skewed distributions.

Application of Bartlett's test of homogeneity of variance showed significant differences in ranking variability for only seven scales. The managerial group was least variable in ranking Ability Utilization, Advancement, and Independence; the skilled white-collar group in ranking Social Status; the nonskilled white-collar group in ranking Authority and Responsibility; and the nonskilled blue-collar in ranking Security. The relatively wide variability in ranks for most scales is again attributable to the negatively skewed distributions of the scale scores.

Using once more the criterion of high mean and low variability to identify characteristic reinforcers, the ranking data indicate that Ability Utilization and Advancement are characteristic of managerial occupations, while Security is characteristic of nonskilled blue-collar occupations. There is also some suggestion that Activity and Moral Values are characteristic reinforcers for the nonskilled white-collar, and Working Conditions for the nonskilled blue-collar workers.

The foregoing findings, on both scale scores and rankings of scale scores, demonstrate that the MIQ is capable of discriminating in several ways among gross occupational groups, and that these discriminations appear to be meaningful from the viewpoint of the

Theory of Work Adjustment and from expectations based on a general knowledge of occupations.

Factorial composition: Intercorrelations among the 20 MIQ scales were factor analyzed for each occupational group.[22] The results are summarized in Table 23.

Two factors were required to account for the common variance of the three non-managerial groups. The factor structures for these three groups were very similar. For each group, the first factor accounted for about 64% of the common variance and had loadings of .40 and above in 15 scales. This factor was defined, for the three groups, by Ability Utilization, Achievement, Advancement, Company Policies and Practices, Compensation, Co-workers, Moral Values, Security, the two Supervision scales, and Working Conditions. The second factor was defined, again for all three non-managerial groups, by Authority, Creativity, Independence, Responsibility, and Social Status. This pattern of loadings is similar to those discussed previously (see Tables 11 and 17). The first factor relates to work reinforcers in general (and thus may be named a general vocational needs dimension), while the second factor relates to reinforcers associated with status.

In contrast to the foregoing findings, three factors were required to account for common variance in the scores of the managerial group. For this group, the first factor accounted for 44% of the common variance, and had high loadings in Ability Utilization, Achievement, Activity, Creativity, Responsibility, and Variety. The second factor accounted for 28% of the common variance and had high loadings in Co-workers, Moral Values, Security, and Working Conditions, with secondary loadings in Company Policies and Practices, Social Service, and the two Supervision scales. The third factor, accounting for the remaining 28% of the common variance, had high loadings in Authority, Compensation, Independence, Recognition, and Social Status, with secondary loadings in Advancement and Responsibility. This pattern of loadings suggests that the first factor pertains to reinforcers associated with achievement; the second factor pertains to working conditions as reinforcers; and the third factor relates to status or recognition reinforcers. It is interesting to note that these three factors correspond roughly to Maslow's "self-actualization," "security" and "ego" needs, re-

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[22] Intercorrelation matrices appear in Appendix B, Tables B-4 through B-7.

Table 23. Varimax factor matrices of MIQ scales, for four occupational groups

Variable	Nonskilled Blue-collar		Nonskilled White-collar		Skilled White-collar		Managerial		
	Factor I	Factor II	Factor I	Factor II	Factor I	Factor II	Factor I	Factor II	Factor III
1. Ability Utilization	**68**	33	**76**	15	**67**	19	**63**	16	−12
2. Achievement	**72**	42	**81**	24	**72**	30	**74**	16	−14
3. Activity	48	50	**47**	34	**52**	37	**56**	18	−05
4. Advancement	**65**	25	**62**	26	**60**	23	34	−02	**−45**
5. Authority	04	**82**	05	**82**	−08	**78**	24	−10	**−65**
6. Company policies and practices	**85**	11	**74**	11	**74**	01	33	**41**	−12
7. Compensation	**64**	25	**56**	21	**49**	17	19	07	**−54**
8. Co-workers	**68**	25	**59**	26	**66**	19	09	**75**	−12
9. Creativity	38	**65**	24	**67**	43	**62**	**76**	01	−15
10. Independence	−02	**62**	04	**48**	18	**39**	−05	21	**−41**
11. Moral Values	**64**	24	**57**	08	**59**	13	30	**55**	−05
12. Recognition	46	45	43	39	37	39	19	11	**−65**
13. Responsibility	35	**75**	35	**74**	29	**78**	**69**	−09	**−48**
14. Security	**77**	07	**73**	11	**63**	08	08	**61**	−02
15. Social Service	50	50	42	44	50	43	37	**44**	−12
16. Social Status	15	**68**	09	**65**	−01	**62**	05	10	**−61**
17. Supervision—Human Relations	**78**	12	**73**	19	**72**	13	47	45	−21
18. Supervision—Technical	**74**	29	**62**	33	**65**	36	44	43	−26
19. Variety	40	48	44	45	44	41	**58**	13	−18
20. Working Conditions	**79**	04	**72**	04	**54**	05	−07	**46**	02
Contribution of Factor	6.91	4.09	6.12	3.44	5.69	3.19	3.67	2.39	2.36
Proportion of Common Variance	.63	.37	.64	.36	.64	.36	.44	.28	.28

Note: Decimal points omitted for factor loadings. Communalities and estimated communalities for these matrices appear in Appendix B, Table B-8.

spectively. It is also worth noting that Compensation, for these managerial workers, is related to the status dimension, rather than the working conditions dimension (as it is for the non-managerial workers).

These data show, then, that covariation on the MIQ scales can be represented in two dimensions for both blue- and white-collar non-managerial workers, but for managers three dimensions are required to represent scale covariation. The greater complexity of need-set organization at higher levels in the occupational hierarchy agrees with typical expectations and contributes to the evidence of validity for the MIQ as a measure of needs.

Reliabilities: Hoyt reliability coefficients, representing proportion of total scale variance reliably attributable to individual differences, are listed for the 20 MIQ scales, and for the four occupational groups, in Table 24.

Table 24 shows that scale reliabilities for the four groups were generally high, and differed little among the groups. On only four

Table 24. Reliability[a] of MIQ scales, for four occupational groups

Scale	Nonskilled Blue-collar	Nonskilled White-collar	Skilled White-collar	Managerial
1. Ability Utilization	.82	.82	.79	.84
2. Achievement	.76	.77	.81	.77
3. Activity	.80	.75	.72	.74
4. Advancement	.84	.86	.84	.85
5. Authority	.85	.88	.90	.90
6. Company policies and practices	.76	.81	.83	.78
7. Compensation	.67	.76	.76	.67
8. Co-workers	.81	.81	.80	.76
9. Creativity	.79	.82	.85	.84
10. Independence	.83	.86	.87	.88
11. Moral Values	.76	.80	.82	.86
12. Recognition	.83	.85	.87	.84
13. Responsibility	.70	.69	.70	.68
14. Security	.78	.84	.81	.86
15. Social Service	.83	.89	.88	.93
16. Social Status	.81	.85	.82	.86
17. Supervision—Human Relations	.79	.72	.77	.54
18. Supervision—Technical	.75	.70	.67	.65
19. Variety	.77	.78	.72	.74
20. Working Conditions	.77	.87	.86	.92

[a] Indicated by Hoyt analysis-of-variance reliability coefficient representing proportion of total variance that is reliable.

scales did the coefficients differ by .10 or more. The largest difference was on the Supervision—Human Relations scale. The proportion of reliable variance for the blue-collar group was 79%, while for the managers it fell below the acceptable minimum, at 54%. A similar pattern was observed for the Supervision—Technical scale, which dropped from 75% for the blue-collar group to a borderline acceptability of 65% for the managers. Conversely, reliabilities for Moral Values and Working Conditions increased with the occupational level. Median scale reliability was .79 for the nonskilled blue-collar group, .82 for the two white-collar groups, and .84 for the managerial group.

These results indicate that the MIQ scales are quite reliable for most occupational groups. For managers, however, reliability is questionable for both Supervision scales, and for the Compensation and Responsibility scales. Any interpretations or inferences made utilizing these scales with managers should be made with caution.

Summary: Comparison of four occupational groups on the MIQ suggest the following: The MIQ is capable of measuring reliably and of differentiating among occupational groups. To the extent that occupational groups are expected to differ in level, variability, rank and structure of vocational needs, the MIQ is a measure of vocational needs. Evidence of validity for the MIQ as a measure of needs is not stronger because of the grossness of occupational groupings used in this study, and because it was assumed that job satisfaction was equivalent for the workers in the different groups. However, the results obtained thus far are consistent with the *Theory of Work Adjustment* and with other expectations concerning vocational needs.

Employment status differences

The *Theory of Work Adjustment* states that the development of a need set depends upon experiences of the individual with the reinforcers appropriate to the needs represented in the set. Thus, differences in vocational need strengths would be expected between an employed group of persons and a group of individuals who have had relatively little or no employment experience. This implies that mean scores for work-specific needs will be lower for the pre-employment group than for the employed group. It also implies that need scores will be less consistent (more variable) for the pre-employment group, compared with the employed group. This would be the result of less uniformity in reinforcement experience for the pre-employment group. Related to this implication, it is also expected that ranking of needs in terms of strength (i.e., importance) would differ between the two groups.

To test these implications, MIQ scores for a pre-employment group of college students were compared with the scores of an employed group of individuals. It was assumed that the college students had had less exposure to work-specific reinforcers than the employed group.

The college student group used in these comparisons was the same group which participated in the test-retest studies. Responses to the first administration of the MIQ were used. A total of 503 students were included in the study. Some descriptive characteristics of the student (pre-employment) group appear in Table 25.

Table 25. Descriptive characteristics of college student (pre-employment) sample (N = 503)

Characteristic	N	%
Age		
18 or less	86	17
19-20	298	59
21-22	56	11
23 or over	63	12
College Class		
freshman	20	4
sophomore	357	71
junior	79	16
senior	33	7
adult special or graduate student	14	2
Sex		
Male	337	67
Female	166	33

The employed sample used in the comparison was a combination of the skilled white-collar and managerial groups involved in the study of occupational differences. This group was chosen for two reasons. First, it was assumed that skilled white-collar and managerial jobs were the kinds of jobs which most of the college students would eventually hold. Thus, the comparison would be between essentially similar groups, except for the factor of occupational experience (and the related variable of age). Secondly, the groups were quite comparable in sex composition, thus eliminating another possible source of need-score difference. The pre-employment group was 67% male; the employed group was 70% male.

There obviously are other factors which enter into the comparison being made. Age is one of prime importance. Although age is a possible explanation for any need-score differences which might occur, it should be pointed out that the *Theory* makes similar predictions concerning age as it does for employment experience.

Level: A comparison of MIQ scale means for the pre-employment and employed groups is shown in Table 26. A one-way analysis of variance showed that differences on 17 of the 20 MIQ scales were statistically significant. The largest differences occurred on the two Supervision scales and the Company Policies and Practices scale. It will be noted that these scales relate to aspects of work with which the pre-employment group probably had the least experience.

The three scales for which mean differences were not statistically significant were Ability Utilization, Social Service and Social Status. These scales presumably involve the kinds of reinforcers with which the pre-employment group had much experience. Thus, absence of significant differences on these scales is not surprising.

Table 26. MIQ scale means for pre-employment and employed groups

Scale	Group		F(1,1002)	p[a]
	Pre-employment	Employed		
1. Ability Utilization	22.1	22.4	3.59	
2. Achievement	21.7	22.1	7.75	.01
3. Activity	18.4	20.3	95.61	.001
4. Advancement	21.2	22.7	59.64	.001
5. Authority	15.5	17.2	52.44	.001
6. Company policies and practices	20.1	22.3	159.51	.001
7. Compensation	19.0	21.2	128.97	.001
8. Co-workers	20.0	20.5	8.32	.01
9. Creativity	19.8	20.9	32.26	.001
10. Independence	14.4	15.8	27.42	.001
11. Moral Values	20.4	21.6	26.58	.001
12. Recognition	19.0	20.3	41.56	.001
13. Responsibility	19.1	20.3	49.21	.001
14. Security	21.0	22.2	34.32	.001
15. Social Service	20.3	20.6	2.68	
16. Social Status	15.4	15.7	1.66	
17. Supervision—Human Relations	20.0	22.3	167.85	.001
18. Supervision—Technical	18.3	21.1	258.94	.001
19. Variety	19.9	20.2	4.03	.05
20. Working Conditions	20.8	21.2	5.37	.05

[a] Probability of error in rejecting null hypothesis of no difference between group means, if $p \leq .05$.

It is worth noting that on every scale for which the mean difference was significant, the pre-employment group mean was the *lower* of the two means. Even on those scales for which differences were not statistically significant, the pre-employment group mean was still the lower mean.

Variability: It was predicted that the variability of scores for the pre-employment group would be greater than variability for the employed group, because of less consistent exposure on the part of the students to work-related reinforcers. A comparison of scale variances, shown in Table 27, supported this prediction. For all 20 MIQ scales, the variance for the pre-employment group was greater than the corresponding variance for the employed group. These differences were statistically significant for 19 of the 20 MIQ scales. The only scale for which the difference was not significant was the Authority scale.

These comparisons of means and variances indicate that the MIQ functions as a measure of vocational needs in accordance with pre-

Table 27. MIQ scale variances for pre-employment and employed groups

Scale	Group		Chi-square[a]	p[b]
	Pre-employment	Employed		
1. Ability Utilization	9.56	4.70	61.75	.001
2. Achievement	8.29	4.23	55.57	.001
3. Activity	12.07	6.08	57.52	.001
4. Advancement	12.11	5.24	85.48	.001
5. Authority	16.43	14.04	3.10	
6. Company policies and practices	9.82	5.35	45.32	.001
7. Compensation	11.49	6.39	42.32	.001
8. Co-workers	10.11	6.13	30.94	.001
9. Creativity	12.88	5.98	71.88	.001
10. Independence	19.46	15.85	5.25	.05
11. Moral Values	15.25	8.83	36.90	.001
12. Recognition	13.16	7.98	31.03	.001
13. Responsibility	9.00	5.64	27.12	.001
14. Security	14.08	6.26	79.86	.001
15. Social Service	15.79	7.22	74.79	.001
16. Social Status	19.11	13.12	17.59	.001
17. Supervision—Human Relations	10.28	4.79	71.24	.001
18. Supervision—Technical	9.14	5.41	34.07	.001
19. Variety	12.56	6.45	54.48	.001
20. Working Conditions	10.59	8.20	8.15	.01

[a] Chi-square value of Bartlett's test of homogeneity of variance with 1 degree of freedom.

[b] Probability of error in rejecting null hypothesis of no difference between group variances, if $p \leq .05$.

dictions derived from the *Theory of Work Adjustment*. The prediction of lower means and larger variances for the pre-employment group was substantiated on 16 of the 20 MIQ scales. The remaining scales—Ability Utilization, Authority, Social Service, and Social Status—failed to fulfill the predictions (although on each of these scales significant group differences on one or the other statistic were observed). These results lend further support to the validity of the MIQ as a measure of vocational needs and the *Theory of Work Adjustment* as a research paradigm.

Ranks: The mean ipsative ranks of needs in terms of importance for the two groups, pre-employment and employed, is shown in Table 28.

These data show that the following needs were ranked more highly by the pre-employment group than by the employed group: Ability Utilization, Achievement, Co-workers, Independence, Social Service, Social Status, Variety and Working Conditions. These needs were given higher relative ranks by the employed group: Advancement, Company Policies and Practices, Compensation, Supervision

Table 28. Mean ipsative ranks for pre-employment and employed groups

	Group			
Scale	Pre-employment	Employed	F(1,1002)	p[a]
1. Ability Utilization	5.4	6.6	23.33	.001
2. Achievement	6.3	7.3	23.57	.001
3. Activity	12.7	12.2	2.29	
4. Advancement	7.0	6.0	14.24	.001
5. Authority	16.3	16.0	1.52	
6. Company policies and practices	9.5	6.9	87.58	.001
7. Compensation	11.5	9.7	34.80	.001
8. Co-workers	9.7	11.3	29.89	.001
9. Creativity	9.8	10.2	1.85	
10. Independence	16.9	17.7	8.42	.01
11. Moral Values	8.6	8.4	0.16	
12. Recognition	11.5	11.6	0.03	
13. Responsibility	11.6	11.8	1.06	
14. Security	7.4	7.1	0.76	
15. Social Service	9.0	11.0	37.80	.001
16. Social Status	16.3	18.0	54.12	.001
17. Supervision—Human Relations	9.6	6.8	114.37	.001
18. Supervision—Technical	13.3	10.1	154.93	.001
19. Variety	9.7	11.8	49.22	.001
20. Working Conditions	7.8	9.3	22.22	.001

[a] Probability of error in rejecting null hypothesis of no difference between mean ranks, if $p \leq .05$.

—Human Relations and Supervision—Technical. The mean ranks for the remaining seven needs were not significantly different between the two groups.

These data partially support the results obtained with scale scores. Significant differences occurred on several scales which were more work-oriented, in accordance with the predictions outlined above.

The comparison of variability of ranks, shown in Table 29, indicated that the employed group was significantly more consistent in its rankings for the following scales: Advancement, Creativity, Independence, Social Service, Social Status and Variety. The pre-employment group, on the other hand, showed less variability in ranking the Supervision—Technical and Working Conditions scales. The differences on the remaining scales were not statistically significant.

Factorial Composition: Scale intercorrelations for the pre-employment group were factor analyzed to determine the underlying

Table 29. Variances of ipsative ranks for pre-employment and employed groups

	Group			
Scale	Pre-employment	Employed	Chi-square[a]	p[b]
1. Ability Utilization	14.00	14.44	0.12	
2. Achievement	12.23	12.32	0.01	
3. Activity	22.59	19.50	2.71	
4. Advancement	22.10	17.97	5.36	.05
5. Authority	18.30	17.19	0.49	
6. Company policies and practices	20.12	18.80	0.58	
7. Compensation	22.74	25.29	1.42	
8. Co-workers	21.78	20.15	0.76	
9. Creativity	25.99	19.60	9.93	.01
10. Independence	21.98	13.01	33.99	.001
11. Moral Values	30.92	27.68	1.54	
12. Recognition	22.03	21.23	0.17	
13. Responsibility	17.74	17.77	0.00	
14. Security	27.73	24.16	2.38	
15. Social Service	32.23	20.52	25.30	.001
16. Social Status	19.01	7.77	96.98	.001
17. Supervision—Human Relations	17.34	15.74	1.17	
18. Supervision—Technical	15.16	18.54	5.07	.05
19. Variety	27.50	20.72	9.99	.01
20. Working Conditions	21.65	27.49	7.13	.01

[a] Chi-square value of Bartlett's test of homogeneity of variance, with 1 degree of freedom.

[b] Probability of error in rejecting null hypothesis of no difference between variance of ranks, if $p \leq .05$.

dimensions accounting for scale covariation.[23] The results are shown in Table 30.

Three factors emerged from this factor analysis. A comparison of these factors with the factors for the managerial and skilled white-collar groups (Table 23) shows that factor structure for the pre-employment group differed from those of the two other groups. Factor I, for the pre-employment group, had high loadings in Ability Utilization, Achievement, Activity, Company Policies and Practices, Co-workers, Moral Values, Social Service, the two Supervision scales, Variety and Working Conditions. This factor accounted for 43% of the common variance. Factor II, accounting for 23% of the common variance, had high loadings on Authority, Creativity, Independence and Responsibility, with secondary loadings on Social Status and Variety. Factor III accounted for 33% of the common

Table 30. Varimax factor matrix of MIQ scales, for the pre-employment group

	Factors				
Variable	I	II	III	Communality	SMC[a]
1. Ability Utilization	64	32	−25	57	62
2. Achievement	74	34	−24	72	74
3. Activity	51	32	−15	38	42
4. Advancement	28	18	−72	62	62
5. Authority	−07	65	−41	59	59
6. Company policies and practices	62	−05	−48	62	64
7. Compensation	15	12	−77	63	59
8. Co-workers	65	−02	−34	54	56
9. Creativity	41	66	−00	61	59
10 Independence	−02	46	00	21	25
11. Moral Values	64	−02	−12	43	42
12. Recognition	27	36	−61	57	58
13. Responsibility	33	72	−19	67	65
14. Security	37	−04	−61	51	53
15. Social Service	65	20	03	46	51
16. Social Status	−13	42	−56	50	50
17. Supervision—Human Relations	68	04	−49	71	75
18. Supervision—Technical	53	10	−48	52	61
19. Variety	49	46	−09	46	52
20. Working Conditions	51	−06	−52	53	51
Contribution of factor	4.72	2.53	3.62	10.86	
Proportion of common variance	.43	.23	.33	1.00	

Note: Decimal points omitted.

[a] Estimated communalities: squared multiple correlation coefficients.

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[23] Scale intercorrelation matrix appears in Appendix B, Table B-9.

variance and had high loadings on Advancement, Compensation, Recognition, and Security.

For the pre-employment group, Factor II and Factor III were easier to interpret than Factor I. Factor II related to independence (in the sense of the opposite of dependence) while Factor III concerned a broader dimension of compensation. Factor I consisted of all other dimensions not included in the other factors and seemed to be more of a general vocational need dimension. However, it had loadings of .40 and higher on only 12 scales and accounted for only 43% of the common variance.

These results indicate that employment experience differentially affects need structures as well as need levels and relative importance. These results give further support to the validity of the MIQ as a measure of vocational needs.

Reliabilities: Table 31 shows that the MIQ scales were reliable measures for the pre-employment group. The Hoyt coefficients in this table vary from a low of .78 for the Responsibility scale to a high of .94 for the Social Service scale. All the reliabilities in Table 31 are well above usual minimum-acceptable levels. This indicates that MIQ results obtained with college students tend to be both

Table 31. Reliability[a] of MIQ scales, for the pre-employment group

Scale	Hoyt coefficient
1. Ability Utilization	.88
2. Achievement	.80
3. Activity	.82
4. Advancement	.91
5. Authority	.90
6. Company policies and practices	.84
7. Compensation	.81
8. Co-workers	.88
9. Creativity	.90
10. Independence	.89
11. Moral Values	.83
12. Recognition	.89
13. Responsibility	.78
14. Security	.92
15. Social Service	.94
16. Social Status	.89
17. Supervision—Human Relations	.84
18. Supervision—Technical	.73
19. Variety	.86
20. Working Conditions	.90

[a] Indicated by Hoyt analysis-of-variance reliability coefficient representing proportion of total variance that is reliable.

statistically and practically significant. When Table 31 is compared with Table 24, the pre-employment group is shown to have responded to almost all scales of the MIQ in a more reliable fashion than the two employed comparison groups.

Summary

The foregoing findings have shown that the MIQ has several desirable psychometric properties. The MIQ scales appear to be extremely reliable, i.e., internally consistent, indicating that the dimensions are perceived by respondents as homogeneous. The MIQ scales also appear to yield sufficient stability of measurement to be useful in vocational diagnosis and prognosis.

Furthermore, the MIQ has been shown to be capable of discriminating among various groups of individuals, and that this discrimination occurs in meaningful ways.

In the study of disability status groups the data support the usual assumption that disability affects personality. Differences in relative strengths of needs between disabled and non-disabled workers suggest hypotheses for further research into the need structures of the disabled.

The data on occupational group differences and employment status differences tend to support implications from the *Theory of Work Adjustment*. In addition, these results lend construct validity to the MIQ as a measure of vocational needs. In several different types of analyses, the observed differences were, for the most part, those predicted by the *Theory*.

These evidences of reliability, stability, and construct validity for the MIQ, together with its ease of administration and scoring and high reading-ease level, meet in large part the criteria for measuring instruments set forth in the introduction. Yet several problems remain in the development of the MIQ. More specific evidences of validity for each of the scales are needed. Scale intercorrelations are somewhat higher than wanted. More and better evidence of test-retest stability is desirable. Skewness of scale score distributions have to be corrected. The following section discusses these problems in more detail.

Further Development of the MIQ

To develop the MIQ into a dependable tool for the vocational psychologist, applicable in both research and practice, studies are being undertaken to improve its technical aspects, and to demonstrate the validity of individual MIQ scales.

Technical aspects

The major technical deficiencies of the MIQ are the skewed distribution of scale scores and the relatively high scale intercorrelations. These problems are interrelated. Both the skewed distributions and the high scale intercorrelations probably result from a rating bias commonly observed in response to items of the type used in the MIQ. This is the general tendency for individuals to choose the "important" end of the scale in responding to the MIQ items. While this rating bias is evident on practically all items, the ability of the instrument to differentiate between groups indicates that the bias is not general. The scale intercorrelations support this contention. While there is some tendency for those who are high on one scale to be high on another, this tendency is differential for different scales and different groups.

A technical problem also closely related to rating bias is that of consistency of response. Since the MIQ is intended for use in research and counseling it is desirable that response to the questionnaire be consistent under varying conditions of administration. However, this probably will not always be possible. People participate both in research and vocational counseling under varying conditions of motivation. Rating bias can be the result of an intentional negative (or positive) distortion of response to the questionnaire.

An experimental adaptation of the MIQ, using a forced-choice format, has been designed to overcome these deficiencies. It is believed that, not only would the forced-choice format eliminate or reduce the rating bias problem, but it also would provide internal checks on the response consistency of the respondent. This experimental form consists of 380 items.[24] Each item is a two-choice alternative. The alternatives utilized in the questionnaire were the MIQ items found to correlate most highly with total scale score on each scale. Only one item was chosen to represent each scale, to eliminate between-item error. Thus the same twenty scales in the MIQ are represented in the experimental form. These items are listed on p. 21, where the MIQ scales are described.

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[24] A copy of the instructions and the first two pages of the questionnaire is in Appendix A. Because of the number of items involved, the entire questionnaire is not reproduced here.

The first 190 items of the experimental form consist of each scale being paired with every other scale. Since there are twenty scales, there are (20 × 19) ÷ 2, or 190, pairs possible. The second 190 items of the form are the same pairs of alternatives as the first 190 items, but with order of alternatives reversed. This repetition of items serves a dual purpose. First, it controls for order of alternatives within an item, since it is possible that some individuals tend to respond consistently to first choice or second choice. Secondly, it serves as a check on the consistency of the respondent. By appropriate scoring of the items, it is possible to arrive at a "consistency" score for the respondent on each of the 20 scales. The consistency score is obtained by counting the number of times on a given scale the individual answers the same item, with alternatives reversed, in the same way. An inconsistency score may be obtained by counting the number of reversals. These scores can then be summed across the 20 scales to yield a total score which indicates whether the individual responded to the questionnaire in a consistent fashion.

Preliminary studies have been started on the experimental form and will be reported in later publications of this series.

Validity studies

Although the data presented in this Bulletin have demonstrated some construct validity for the MIQ, more specific evidences of validity are necessary for each MIQ scale. Toward this end, a series of studies is being undertaken, the general design of which is as follows:

The *Theory of Work Adjustment* states that job satisfaction is a function of correspondence between a worker's needs and the reinforcement offered by the work environment. For a given reinforcer and its associated need, satisfaction is a function of the correspondence between the worker's need and the amount of reinforcement the reinforcer provides on the job.

To use the above paradigm in validity studies for individual MIQ scales, a questionnaire was constructed to reflect satisfaction on the same twenty scales measured by the MIQ. Validation of an

MIQ scale would then involve a comparison of satisfaction for two groups of workers whose need scores are the same, but who are in jobs which offer differing amounts of the particular reinforcer under study.

Studies are in process which follow this general pattern. As an example, workers with high Authority needs are separated into groups on the basis of the amount of authority their jobs provide, such as top executives vs. first-line supervisors vs. rank-and-file clerical workers. The major prediction is that mean satisfaction scores on the Authority dimension would decrease with decreasing amount of authority provided by the job. Further, it is expected that satisfaction score variability for both the high and low authority groups will be lower than that of the intermediate-level-of-authority group.

A similar design is being followed for the other MIQ scales. High need groups are divided by job into high, medium and low reinforcement groups. Group differences in satisfaction scores are examined as evidence of validity for the need scale.

Occupational reinforcer patterns

Utilizing derivations from the *Theory of Work Adjustment,* an attempt is being made to determine patterns of occupational reinforcers in various jobs. Occupational Reinforcer Patterns (ORPs) parallel the Occupational Aptitude Patterns (OAPs) developed by the U. S. Employment Service. Where the OAP is useful in predicting job satisfactoriness (and such tenure outcomes as involuntary job termination), the ORP may prove useful in predicting job satisfaction (and tenure outcomes of voluntary job separation).

Several approaches are being used in the development of ORPs. A "mean difference" approach is patterned after the method used in developing OAPs. This approach requires "high" and "low" criterion groups, with general job satisfaction as the criterion. Significant need scale mean differences between the groups identify the reinforcers on the job. Multivariate techniques, with satisfaction as the dependent variable and need scores as the independent variables, are being utilized in another approach to the identification of ORPs. A third approach utilizes a "difference score" (between need and satisfaction on each reinforcer dimension) in comparing a specific occupational group with a total employed group.

By a combination of these approaches, it is hoped that patterns of reinforcers which are specific to a certain occupation can be determined. Such patterns can then be utilized by the vocational counselor in exploring with the counselee his probable satisfaction with the various occupations he is considering.

It should also be noted that the projected development of ORPs constitutes both a validation of the MIQ scales, and empirical support for the *Theory of Work Adjustment,* since it is predicated on the same assumptions underlying the validity studies described above.

Additional dimensions

The 20 dimensions measured by the MIQ were the result of previous research in the area of need measurement and job satisfaction. It was never assumed that these 20 dimensions constituted the totality of reinforcers effective in the employment situation, or the totality of human work-related needs. Continuing attempts will be made to add relevant dimensions to the MIQ as they are found to exist as reinforcers in the work environment.

Use of the MIQ

All instruments reported in this Bulletin are copyrighted by the Industrial Relations Center, University of Minnesota. The questionnaires are available without charge to all qualified persons, for either research or counseling purposes, by arrangement with the Region VI Regional Vocational Rehabilitation Research Institute, provided that completed questionnaires are made available to the Regional Research Institute for research and normative purposes. The following is a summary of instructions for the use of the MIQ adapted from the Counselor's Manual[25] for the instrument.

Administration

The MIQ is self-administering. All directions necessary for the respondent appear on the inside first page of the questionnaire. Relevant rating instructions are repeated at the top of each page.

There is no time limit for the MIQ. However, the individual should be encouraged to answer the questions immediately upon deciding on his response. The individual should respond rapidly to the alternatives. Since the MIQ is not a "test" but a questionnaire dependent on self report, the respondent's motivational state should be as favorable as is possible.

Experience with the MIQ indicates that the average worker completes the questionnaire in from 15 to 20 minutes. The shortest time observed in an employed group was about ten minutes; the slowest individual took about 30 minutes. In no case has administration time taken over 30 minutes.

Additional information concerning administration appears in the Counselor's Manual.

Scoring

Accompanying each MIQ booklet is a combination scoring sheet and profile (see Figures 1 and 2). To use the scoring sheet, begin on Side 1. Each item in the MIQ is scored from 1 to 5. A score of 1 is for "very unimportant," 2 is "not important," 3 is "neither," 4 is "important," and 5 is "very important." On Side 1 of the scoring-

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[25] Weiss, D. J. *Counselor's Manual for the Minnesota Importance Questionnaire*, Vocational Rehabilitation Research Institute, Industrial Relations Center, University of Minnesota, 1963. Mimeographed.

Side
1

1. WC = working conditions
2. Com = compensation (pay)
3. Sec = security
4. Var = variety
5. Aut = authority
6. AU = ability utilization
7. SSt = social status
8. CPP = company policies and practices
9. SHR = supervision, human relations
10. Act = activity
11. MV = moral values
12. Res = responsibility
13. Rec = recognition
14. Ach = achievement
15. Adv = advancement
16. ST = supervision, technical
17. Cow = co-workers
18. SSe = social service
19. Cre = creativity
20. Ind = independence

Minnesota Importance Questionnaire

Name____________________ Number________ Date________

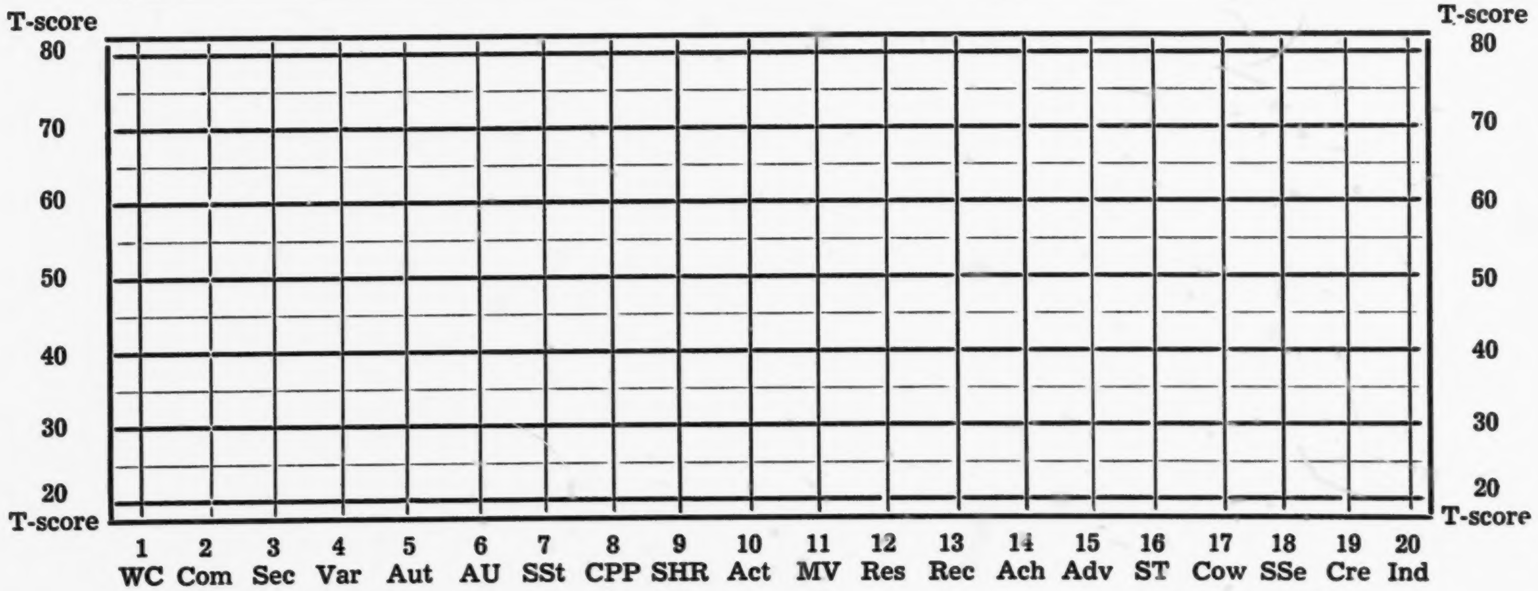
Items																				
1-20																				
21-40																				
41-60																				
61-80																				
81-100																				
Raw Scores	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	WC 1	Com 2	Sec 3	Var 4	Aut 5	AU 6	SSt 7	CPP 8	SHR 9	Act 10	MV 11	Res 12	Rec 13	Ach 14	Adv 15	ST 16	Cow 17	SSe 18	Cre 19	Ind 20

Figure 1. Combination scoring-profile sheet for MIQ: Side 1—Scoring

Minnesota Importance Questionnaire

Side 2

Name__________ Number__________ Date__________



Norm Group 1__________ Norm Group 2__________ Norm Group 3__________

T-scores

Norm Group																					Norm Group
1																					1
2																					2
3																					3

Figure 2. Combination scoring-profile sheet for MIQ: Side 2—Profile Chart

profile sheet (Figure 1) there are 100 boxes in five lines of twenty boxes each.

Step 1. Beginning with Item 1 of the MIQ, record the value (1-5) of each item response in sequence in the 100 boxes, beginning at the left and proceeding to the right and beginning with the uppermost line and proceeding to the lower lines. If any items are not answered, leave the box for that item blank.

Step 2. To obtain scale scores: sum the five numbers appearing in each vertical column and record the result in the box just beneath that column. The twenty scores thus obtained are the raw scores on the twenty scales of the MIQ. The scores should vary from a minimum of 5 to a maximum of 25.

Step 3. Scan the 100 item response boxes for blanks (unanswered items). If all items have been answered, go to Step 4. If more than one item per scale is blank, the results should be considered unusable. For scales in which only four items have been answered, divide the total scale score by 4 and multiply the result by 5. The result of this procedure, rounded to the nearest integer, is the new scale score for that scale, and should replace the 4-item scale score recorded previously.

Step 4. To obtain T-scores, fold the top of Side 1 down so that the top of the sheet is just above the row of scale scores. When this is done, three sets of twenty boxes from the reverse side of the sheet will appear just above the scale scores. These boxes are for recording T-scores. Refer to the appropriate norm group tables for the T-score value of the scale score for each of the twenty scales and record them in these boxes. For those who desire to compare the individual on several sets of norms, repeat the above process for up to three sets of T-scores. Record each set of T-scores on the appropriate line at the bottom of Side 2. Be sure to identify the norm group(s) in the space(s) provided just below the profile chart.

Step 5. To plot T-score values: completely unfold the profile sheet so that Side 2 is facing upward. Plot the appropriate T-score values for each scale on the profile chart. Wherever more than one norm group has been used, it is advisable to plot the scores in different colored lines. Be sure to identify the profile sheet by completing case number, name and date at the top of Side 2.

Arrangements for scoring the questionnaires by computer can be made through the Region VI Regional Research Institute if about 100 or more questionnaires are to be scored at one time.

Norms

Norms for the MIQ are presented in Tables 32 through 38. These norms are T-score norms, with a mean of 50 and a standard deviation of 10. Norms are available for the following groups:

Table 32: General working population (excluding disabled workers). All occupational groups combined. This sample is a combination of the two-firm sample and Work Adjustment Project non-disabled sample studied in this Bulletin. (The occupational samples below are sub-sets of this total sample).

Table 33: Employed disabled workers. This sample is the Work Adjustment Project disabled sample.

Table 34: Nonskilled blue-collar workers.

Table 35: Nonskilled white-collar workers.

Table 36: Skilled white-collar workers.

Table 37: Managerial workers.

Table 38: College students.

Additional norms will be developed as they become available.

NOTE

To facilitate recording of T-score equivalents for the scale scores on the profile sheets, **the order of scales in Tables 32 through 38 is different from that used throughout the preceding sections of this Bulletin.** The order is the same as the order in which items appear in the questionnaire. The list of scale names corresponding to the abbreviations used in these Tables appears in Figure 1.

Table 32. T-score Equivalents of Raw Scores

GENERAL WORKING POPULATION

(Excluding Physically Handicapped Workers) (N = 1,771)

Raw Score	WC 1	Com 2	Sec 3	Var 4	Aut 5	AU 6	SSt 7	CPP 8	SHR 9	Act 10	MV 11	Res 12	Rec 13	Ach 14	Adv 15	ST 16	Cow 17	SSe 18	Cre 19	Ind 20	Raw Score
25	62	65	59	67	73	62	75	62	61	68	62	70	66	63	61	65	65	65	67	73	25
24	59	61	56	64	70	59	72	58	58	64	59	67	63	60	57	62	61	62	64	71	24
23	56	58	52	61	68	55	70	55	54	61	56	63	60	56	54	58	58	59	60	68	23
22	52	55	49	58	65	52	67	51	51	58	52	60	57	52	51	55	54	56	57	66	22
21	49	51	46	55	63	48	65	48	47	54	49	56	54	48	48	51	51	52	54	63	21
20	46	48	42	52	60	45	62	44	44	51	46	53	51	44	45	48	48	49	51	61	20
19	43	45	39	49	58	41	59	41	40	48	43	50	48	40	42	44	44	46	48	58	19
18	39	41	36	46	55	38	57	37	37	44	40	46	45	37	38	41	41	43	44	56	18
17	36	38	32	43	53	34	54	34	33	41	37	43	42	33	35	37	37	39	41	54	17
16	33	34	29	40	50	31	52	30	30	38	33	39	39	29	32	34	34	36	38	51	16
15	30	31	25	36	48	27	49	27	26	34	30	36	36	25	29	30	30	33	35	49	15
14	27	28	22	33	45	24	47	23	23	31	27	33	33	21	26	27	27	30	32	46	14
13	23	24	19	30	43	20	44	20	19	28	24	29	30	17	23	23	23	26	29	44	13
12	20	21	15	27	40	17	42	16	16	2[illegible]	21	26	28	14	20	20	20	23	25	41	12
11	17	18	12	24	38	13	39	13	12	21	17	22	25	10	16	16	16	20	22	39	11
10	14	14	9	21	35	10	37	9	8	18	14	19	22	6	13	13	13	17	19	37	10
9	11	11	5	18	33	6	34	6	5	14	11	16	19	2	10	9	10	13	16	34	9
8	7	7	2	15	30	3	32	2	1	11	8	12	16		7	6	6	10	13	32	8
7	4	4		12	28		29			8	5	9	13		4	2	3	7	10	29	7
6	1	1		9	25		26			4	2	5	10		1			4	6	27	6
5				6	22		24			1			7					0	3	24	5

Table 33. T-score Equivalents of Raw Scores

EMPLOYED PHYSICALLY HANDICAPPED

(N = 507)

Raw Score	WC 1	Com 2	Sec 3	Var 4	Aut 5	AU 6	SSt 7	CPP 8	SHR 9	Act 10	MV 11	Res 12	Rec 13	Ach 14	Adv 15	ST 16	Cow 17	SSe 18	Cre 19	Ind 20	Raw Score
25	61	65	58	67	75	60	78	61	61	68	61	69	67	61	61	66	65	64	65	75	25
24	59	63	56	65	72	58	76	59	59	66	59	66	64	59	58	64	62	61	63	73	24
23	57	60	54	62	70	56	73	57	57	63	57	63	62	56	56	61	60	59	61	70	23
22	54	57	52	60	68	53	71	54	54	60	55	61	60	54	54	58	57	57	58	68	22
21	52	55	50	57	65	51	68	52	52	58	52	58	57	51	51	56	54	54	56	65	21
20	50	52	48	55	63	49	66	50	50	55	50	55	55	49	49	53	52	52	54	63	20
19	48	50	46	52	60	46	63	47	47	52	48	53	52	47	47	50	49	50	51	61	19
18	45	47	43	50	58	44	61	45	45	50	46	50	50	44	44	48	46	47	49	58	18
17	43	44	41	47	55	42	58	43	43	47	44	47	47	42	42	45	44	45	46	56	17
16	41	42	39	45	53	39	56	40	40	44	41	45	45	39	40	42	41	42	44	54	16
15	38	39	37	42	51	37	53	38	38	42	39	42	42	37	37	40	38	40	42	51	15
14	36	37	35	40	48	35	51	36	35	39	37	39	40	35	35	37	36	38	39	49	14
13	34	34	33	37	46	32	48	33	33	37	35	37	37	32	33	34	33	35	37	46	13
12	31	31	31	35	43	30	46	31	31	34	33	34	35	30	30	32	31	33	35	44	12
11	29	29	28	32	41	27	43	29	28	31	31	31	32	28	28	29	28	30	32	42	11
10	27	26	26	30	39	25	41	26	26	28	28	29	30	25	26	26	25	28	30	39	10
9	24	24	24	27	36	23	38	24	24	26	26	26	27	23	23	24	23	26	28	37	9
8	22	21	22	25	34	21	36	22	21	23	24	23	25	20	21	21	20	23	25	35	8
7	20	18	20	22	31	19	33	19	19	20	22	21	22	18	19	18	17	21	23	32	7
6	18	16	18	20	29	16	31	17	17	18	20	18	20	16	16	16	15	19	21	30	6
5	15	13	16	17	26	14	28	15	14	15	17	15	17	13	14	13	12	16	18	27	5

Table 34. T-score Equivalents of Raw Scores

NONSKILLED BLUE-COLLAR

(N = 716)

Raw Score	WC 1	Com 2	Sec 3	Var 4	Aut 5	AU 6	SSt 7	CPP 8	SHR 9	Act 10	MV 11	Res 12	Rec 13	Ach 14	Adv 15	ST 16	Cow 17	SSe 18	Cre 19	Ind 20	Raw Score
25	62	66	58	69	74	64	75	62	60	68	63	71	66	65	62	65	64	66	68	73	25
24	59	62	55	65	72	61	72	59	57	65	60	68	63	61	59	61	60	63	65	71	24
23	56	59	52	63	69	57	69	56	54	62	57	65	60	57	56	58	57	60	62	68	23
22	52	56	48	60	67	54	67	52	51	58	54	62	57	53	53	55	54	57	59	66	22
21	49	52	45	57	64	50	64	49	48	55	51	58	55	50	51	52	50	53	56	63	21
20	45	49	41	54	61	47	62	46	45	52	48	55	52	46	48	48	47	50	53	61	20
19	42	45	38	51	59	44	59	42	42	49	44	52	49	42	45	45	44	47	49	58	19
18	39	42	35	48	56	40	57	39	39	46	41	49	46	39	42	42	40	44	46	56	18
17	35	39	31	45	54	37	54	36	35	43	38	45	43	35	39	39	37	41	43	54	17
16	32	35	28	42	51	34	52	32	32	40	35	42	41	31	36	35	34	37	40	51	16
15	29	32	24	39	49	30	49	29	29	37	32	39	39	27	33	32	31	34	37	49	15
14	25	28	21	36	46	27	47	26	26	34	28	35	35	24	30	29	27	31	34	46	14
13	22	25	18	33	43	24	44	22	23	30	25	32	32	20	28	26	24	28	31	44	13
12	18	21	14	30	41	20	41	19	20	27	22	29	29	16	25	22	21	25	28	41	12
11	15	18	11	27	38	17	39	16	17	24	19	26	27	13	22	19	17	22	24	39	11
10	12	15	7	24	36	13	36	13	14	21	16	22	24	10	19	16	14	18	21	37	10
9	9	11	3	21	33	10	34	9	10	18	13	19	21	6	16	13	10	15	18	34	9
8	5	8		18	31	7	31	6	7	15	9	16	18	3	13	9	7	12	15	32	8
7	2	4		15	28	4	29	3	4	12	6	13	15		10	6	4	9	12	29	7
6				13	25	0	26		1	8	3	10	12		8	3	1	6	9	26	6
5				10	23		24			6		7	10		5			3	6	24	5

Table 35. T-score equivalents of raw scores

NONSKILLED WHITE-COLLAR

(N = 416)

Raw Score	WC 1	Com 2	Sec 3	Var 4	Aut 5	AU 6	SSt 7	CPP 8	SHR 9	Act 10	MV 11	Res 12	Rec 13	Ach 14	Adv 15	ST 16	Cow 17	SSe 18	Cre 19	Ind 20	Raw Score
25	61	63	58	67	62	61	74	62	61	67	61	71	65	63	60	65	63	64	68	72	25
24	58	60	55	64	58	58	71	58	58	64	58	68	62	59	57	61	60	61	64	70	24
23	55	56	52	61	54	54	69	54	54	60	55	64	59	55	53	58	56	58	61	67	23
22	51	53	48	58	51	51	66	51	50	57	51	61	56	51	50	54	53	55	58	65	22
21	48	50	45	55	47	47	64	47	46	53	48	57	55	47	46	50	50	52	55	63	21
20	45	47	42	52	43	44	62	43	43	50	45	54	50	44	43	47	46	48	52	60	20
19	42	44	38	49	39	40	59	39	39	46	41	50	47	40	39	43	43	45	49	58	19
18	39	41	35	46	36	37	57	36	35	43	38	47	44	36	36	40	39	42	46	55	18
17	35	38	32	43	32	33	54	32	31	39	34	43	42	32	33	36	36	39	43	53	17
16	32	35	28	40	28	30	52	28	28	36	31	40	39	28	29	33	32	36	40	51	16
15	29	31	25	37	25	27	50	25	24	32	28	37	36	25	26	29	29	32	37	48	15
14	26	28	21	33	21	23	47	21	20	29	24	33	33	21	22	25	26	29	34	46	14
13	22	25	18	30	18	19	45	18	16	25	21	30	30	17	19	21	22	26	30	43	13
12	19	22	14	27	14	16	42	14	13	22	17	26	27	13	15	17	18	23	27	41	12
11	16	19	11	24	10	13	40	9	9	18	13	23	24	9	12	14	14	20	24	38	11
10	13	16	8	21	6	9	38	6	5	15	10	19	21	6	9	11	11	17	21	36	10
9	10	13	5	18	2	6	35	2	1	11	7	16	18	2	5	8	8	13	18	34	9
8	6	10	2	15		3	33			8	4	12	15			4	4	10	15	31	8
7	3	7		12			30			4	1	9	12				1	7	12	29	7
6		3		9			28			1			9					4	9	26	6
5		0		6			26						7					0	6	24	5

Table 36. T-score Equivalents of Raw Scores

SKILLED WHITE-COLLAR

(N = 456)

Raw Score	WC 1	Com 2	Sec 3	Var 4	Aut 5	AU 6	SSt 7	CPP 8	SHR 9	Act 10	MV 11	Res 12	Rec 13	Ach 14	Adv 15	ST 16	Cow 17	SSe 18	Cre 19	Ind 20	Raw Score
25	62	65	59	68	71	61	76	61	61	68	61	70	66	63	60	66	67	65	66	73	25
24	59	61	56	64	69	57	74	57	57	64	58	66	63	59	56	62	63	62	63	70	24
23	55	58	52	61	66	54	71	54	54	61	54	62	60	55	53	58	58	58	59	68	23
22	52	55	49	58	64	50	69	50	50	57	51	58	57	51	49	55	56	55	56	65	22
21	49	51	46	54	61	46	66	47	46	54	48	55	54	47	45	51	52	51	52	63	21
20	46	48	42	51	59	42	63	43	43	50	45	51	51	43	42	47	48	48	49	60	20
19	43	44	39	47	56	38	61	39	39	46	42	47	48	39	38	44	44	44	46	58	19
18	39	41	35	44	54	34	58	36	35	43	39	43	45	35	34	40	40	41	42	56	18
17	36	38	32	41	51	30	55	32	31	39	35	39	42	31	31	36	37	37	39	53	17
16	33	34	29	37	49	26	53	29	28	36	32	36	39	27	27	33	33	34	35	51	16
15	30	31	25	34	46	23	50	25	24	32	29	32	35	23	23	29	29	30	32	48	15
14	27	27	22	31	44	19	48	22	21	29	26	28	32	19	20	25	25	27	28	46	14
13	24	24	19	27	41	15	45	18	17	25	23	24	29	15	16	22	21	23	25	43	13
12	20	20	15	24	39	11	42	15	13	22	19	21	26	11	12	18	18	20	21	41	12
11	17	17	12	20	36	7	40	12	9	18	16	17	23	7	9	14	14	16	18	38	11
10	14	14	8	17	34	3	37	8	5	15	13	13	20	3	5	11	10	13	14	36	10
9	11	10	5	14	31		34	4	1	11	10	9	17		1	7	6	10	11	33	9
8	7	7	1	10	29		32			8	7	6	14			3	2	6	7	31	8
7	4	4		7	26		29			4	4	2	11					2	4	28	7
6	1			3	24		27			1	0		8							26	6
5					21		24						5							23	5

Table 37. T-score Equivalents of Raw Scores

MANAGERIAL

(N = 183)

Raw Score	WC 1	Com 2	Sec 3	Var 4	Aut 5	AU 6	SSt 7	CPP 8	SHR 9	Act 10	MV 11	Res 12	Rec 13	Ach 14	Adv 15	ST 16	Cow 17	SSe 18	Cre 19	Ind 20	Raw Score
25	65	66	65	68	69	61	75	63	65	70	61	68	66	63	60	70	70	67	65	76	25
24	62	62	61	64	67	56	72	59	60	66	58	64	63	59	56	65	66	63	61	73	24
23	59	58	58	60	64	52	69	54	56	62	55	60	59	54	52	61	63	60	57	68	23
22	56	54	54	56	61	48	66	50	51	58	52	55	56	50	49	57	59	57	52	66	22
21	53	50	50	51	59	44	64	46	46	55	49	51	53	45	45	53	55	54	48	63	21
20	50	47	47	47	56	40	61	42	42	51	46	47	49	41	41	48	52	50	44	61	20
19	47	43	43	43	53	35	58	37	37	47	43	43	46	36	38	44	48	47	40	59	19
18	44	39	39	39	51	30	56	33	32	43	40	39	43	32	34	40	44	44	36	56	18
17	41	35	35	35	48	26	53	29	27	39	37	35	39	28	30	36	41	40	32	54	17
16	38	31	32	31	45	22	50	25	22	36	34	31	36	24	26	32	37	37	28	51	16
15	35	27	28	27	43	19	48	21	17	32	31	26	32	19	23	27	33	34	23	49	15
14	32	23	24	22	40	14	45	17	12	28	28	22	29	14	19	23	29	31	19	46	14
13	29	19	21	18	37	10	42	13	7	24	25	18	26	10	15	19	26	27	15	44	13
12	25	15	17	14	35	5	39	11	2	20	22	14	22	6	11	14	18	24	12	41	12
11	22	11	13	10	32	1	37	6		17	19	10	19	1	7	10	15	21	7	39	11
10	19	8	10	5	30		34	2		13	16	6	16		3	6	11	18	3	36	10
9	16	4	6	1	27		31			9	13	2	13			2	7	14		34	9
8	13		2		24		29			5	10		9				3	11		31	8
7	10				22		26			2	7		6					8		29	7
6	7				20		23				4		3					5		27	6
5	4				17		21				1							1		24	5

Table 38. T-score Equivalents of Raw Scores

COLLEGE STUDENTS

(N = 503)

Raw Score	WC 1	Com 2	Sec 3	Var 4	Aut 5	AU 6	SSt 7	CPP 8	SHR 9	Act 10	MV 11	Res 12	Rec 13	Ach 14	Adv 15	ST 16	Cow 17	SSe 18	Cre 19	Ind 20	Raw Score
25	63	68	61	64	74	59	72	65	66	69	62	70	67	62	61	72	66	62	64	74	25
24	60	65	58	62	71	56	70	62	62	66	59	66	64	58	58	69	63	59	62	72	24
23	57	62	55	59	69	53	67	59	59	63	57	63	61	55	55	65	59	57	59	69	23
22	54	59	53	56	66	50	65	56	56	60	54	60	58	51	52	62	56	54	56	67	22
21	51	56	50	53	64	46	63	53	53	57	51	56	56	48	49	59	53	52	53	65	21
20	48	53	47	50	61	43	61	50	50	54	49	53	53	44	46	56	50	49	50	63	20
19	44	50	45	48	59	40	58	46	47	52	46	50	50	41	44	52	47	47	48	60	19
18	41	47	42	45	56	37	56	43	44	49	44	46	47	37	41	49	44	44	45	58	18
17	38	44	39	42	54	34	54	40	41	46	41	43	44	34	38	46	41	42	42	56	17
16	35	41	37	39	51	30	51	37	37	43	39	40	42	30	35	42	37	39	39	54	16
15	32	38	34	36	49	27	49	34	34	40	36	36	39	27	32	39	34	37	37	51	15
14	29	35	31	33	46	24	47	30	31	37	33	33	36	23	29	36	31	34	34	49	14
13	26	32	29	31	44	21	45	27	28	34	31	30	33	20	26	32	28	32	31	47	13
12	23	29	26	28	41	17	42	24	25	31	28	26	31	16	23	29	25	29	28	44	12
11	20	26	23	25	39	14	40	21	22	29	26	23	28	12	21	26	22	27	25	42	11
10	17	23	21	22	36	11	38	17	19	26	23	20	25	9	18	22	19	24	23	40	10
9	14	20	18	19	34	7	35	14	16	23	21	16	22	6	15	19	15	22	20	38	9
8	11	17	15	17	32	4	33	11	12	20	18	13	20	2	12	16	12	20	17	35	8
7	8	14	13	14	29	1	31	8	9	17	16	10	17		9	13	9	17	14	33	7
6	4	12	10	11	27		29	5	6	14	13	6	14		6	9	6	14	11	31	6
5	1	9	7	8	24		26	2	3	11	10	3	11		3	6	3	12	9	29	5

APPENDIXES

Appendix A

N-Factors Questionnaire

Work Adjustment Project
Industrial Relations Center
N-Factors Questionnaire

Code No. ☐

CONFIDENTIAL

My ideal occupation is:________________________________

On the following four pages are some statements about occupations. Please answer these questions with your ideal occupation in mind. For each statement:

Check the box under "Yes" if the statement is a reason why you think this occupation is the ideal one for you;

Check "No" if it is not a reason.

Please answer every statement.

Remember, keep your ideal occupation in mind, and answer every statement by saying to yourself: "I think this occupation is the ideal occupation for me because . . ."

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"I think this occupation is the ideal occupation for me because . . ."

Yes No

1. you're sure to get credit for something you do well 1. ☐ ☐
2. you don't have to work alone 2. ☐ ☐
3. the work is hard and it brings out the best in you 3. ☐ ☐
4. you are a leader; you know more than those around you and you tell them how to do things right 4. ☐ ☐
5. service to mankind is about the best thing a man can do 5. ☐ ☐
6. you can say what you think, and do what you think you ought to do and act just the way you feel 6. ☐ ☐
7. you get a chance to live in a better neighborhood 7. ☐ ☐
8. you can do the job without feeling that you're doing something wrong 8. ☐ ☐
9. there is always someone around you can depend on when problems come up 9. ☐ ☐
10. you keep doing new things on your own 10. ☐ ☐
11. you can work until retirement and know that there will be retirement pay when you stop working 11. ☐ ☐
12. nobody hardly ever tells you what to do 12. ☐ ☐

Yes No

"I think this occupation is the ideal occupation for me because . . ."

Yes No

13. you make the decisions 13. ☐ ☐
14. you get a chance to help lots of people 14. ☐ ☐
15. you get a chance to be yourself 15. ☐ ☐
16. you have a chance to get lots of things, like a car, a boat, or a summer cabin 16. ☐ ☐
17. all the things you have to do agree with your religious beliefs 17. ☐ ☐
18. you don't have to make any big decisions by yourself 18. ☐ ☐
19. you can dream up new things or invent new ways to do things 19. ☐ ☐
20. you can always depend on getting paid 20. ☐ ☐
21. you are your own boss 21. ☐ ☐
22. you know that somebody will appreciate what you're doing when you do a good job 22. ☐ ☐
23. you get a chance to meet a lot of people 23. ☐ ☐
24. when you do a job you can say, "I did a darn good job!" 24. ☐ ☐

Yes No

"I think this occupation is the ideal occupation for me because . . ."

Yes No

25. you get a chance to rub elbows with important people 25. ☐ ☐

26. if you think it is wrong to do something, you don't have to do it 26. ☐ ☐

27. you don't have the headaches of a lot of responsibility 27. ☐ ☐

28. you get a chance to try something new—something you haven't done before 28. ☐ ☐

29. you are not taking a chance on becoming unemployed 29. ☐ ☐

30. you work alone most of the time without anyone around giving you orders 30. ☐ ☐

31. when you do a good job, people will know you did it 31. ☐ ☐

32. you work with many people and get a chance to make many friends 32. ☐ ☐

33. when you do something, you get a chance to do it well 33. ☐ ☐

34. you give orders rather than take them 34. ☐ ☐

35. you get satisfaction from knowing that you've done something to help someone else 35. ☐ ☐

36. you get a lot of time off the job to do the things you want to do 36. ☐ ☐

Yes No

"I think this occupation is the ideal occupation for me because . . ."

Yes No

37. you always have new problems to figure out 37. ☐ ☐

38. the job will always be there as long as you want it 38. ☐ ☐

39. you get a chance to do things on your own without somebody telling you how 39. ☐ ☐

40. it's easy to get noticed by the boss for doing a good job 40. ☐ ☐

41. you work with a group of people whom you get to know real well 41. ☐ ☐

42. the work is a challenge and you can take pride in a job well done 42. ☐ ☐

43. you tell other people what to do and how to do it 43. ☐ ☐

44. you get pleasure from helping in some small way to make the world a better place 44. ☐ ☐

45. you can "let your hair down" and express yourself 45. ☐ ☐

46. people look up to you 46. ☐ ☐

47. there's nothing in it that will make you go against your conscience 47. ☐ ☐

48. you can get help and advice from somebody when you need it 48. ☐ ☐

Yes No

CONFIDENTIAL

university of minnesota

industrial relations center

importance questionnaire

MINNESOTA STUDIES IN VOCATIONAL REHABILITATION

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Industrial Relations Center
University of Minnesota

THE MEASUREMENT OF VOCATIONAL NEEDS

The purpose of this questionnaire is to find out what you consider **important** *or* **unimportant** *to have in* **your ideal job.** *Please answer the following statements in terms of* **how important or unimportant it is to you in determining an ideal job for you.**

The Industrial Relations Center at the University of Minnesota needs this information in its research program. On the basis of your answers and those of thousands of other individuals throughout the nation, we hope to get a better understanding of what people consider **important or unimportant to an ideal job.**

On the following pages you will find statements about work.

- *Read each statement carefully.*
- *Decide how* **important or unimportant it is to an ideal job for you,** *the kind of job that you would most like to have.*
  - *—if you feel that it is* **absolutely essential to an ideal job,** *that you cannot do without it, check the box under "Very Impt" (Very Important).*
  - *—if you feel that it is* **essential to an ideal job,** *but not quite very important, check the box under "Impt" (Important).*
  - *—if you feel that it is* **neither important nor unimportant to an ideal job,** *or you cannot make up your mind about the statement, check the box under "N" (Neither).*
  - *—if you feel that it is* **not essential to an ideal job,** *that it is not important, check the box under "Not Impt" (Not Important).*
  - *—if you feel that it is* **not at all essential to an ideal job,** *that you can easily do without it, check the box under "Very Unimpt" (Very Unimportant).*
- *Remember: Keep the statement in mind when deciding how* **important or unimportant it is to an ideal job for you.**
- *Do this for* **all** *statements. Please answer* **every** *item.*

Be frank and honest. *Give us a true picture of what you consider important or unimportant in your* **ideal job.**

*Ask yourself: How **important** is it to an **ideal job** for me; the kind of job I would most like to have?*

***Very Impt.** means very important; absolutely essential; cannot do without it.*

***Impt.** means important (but not quite very important).*

***N** means neither important nor unimportant; can't decide.*

***Not Impt.** means not important (but not quite very unimportant).*

***Very Unimpt.** means very unimportant; not essential at all; can do without it.*

On my ideal job, how important is it that . . .	Very Unimpt.	Not Impt.	N	Impt.	Very Impt.
1. The job would have good physical working conditions.	☐	☐	☐	☐	☐
2. My pay would be fair for the amount of work I do.	☐	☐	☐	☐	☐
3. I could feel secure about the job.	☐	☐	☐	☐	☐
4. I could have variety in my work.	☐	☐	☐	☐	☐
5. I could have other workers look to me for direction.	☐	☐	☐	☐	☐
6. I could do work that is well suited to my abilities.	☐	☐	☐	☐	☐
7. The job would carry high social position with it.	☐	☐	☐	☐	☐
8. The company would have definite policies towards its employees.	☐	☐	☐	☐	☐
9. My supervisor and I would understand each other.	☐	☐	☐	☐	☐
10. I could be active much of the time.	☐	☐	☐	☐	☐
11. I could do things that don't go against my religious beliefs.	☐	☐	☐	☐	☐
12. I could be responsible for planning my own work.	☐	☐	☐	☐	☐
13. I would be noticed when I do a good job.	☐	☐	☐	☐	☐
14. I could see the results of the work I do.	☐	☐	☐	☐	☐
15. I could advance on the job.	☐	☐	☐	☐	☐
16. My supervisor would have a lot of technical "know-how."	☐	☐	☐	☐	☐
17. The people I work with would have a good spirit of cooperation.	☐	☐	☐	☐	☐
18. I could be of service to others.	☐	☐	☐	☐	☐
19. I could do new and original things on my own.	☐	☐	☐	☐	☐
20. I could work by myself.	☐	☐	☐	☐	☐
21. The job would have good working conditions.	☐	☐	☐	☐	☐
22. I could make as much money as my friends.	☐	☐	☐	☐	☐
23. The job would provide for a secure future.	☐	☐	☐	☐	☐
24. I could do different things from time to time.	☐	☐	☐	☐	☐
25. I could tell other workers how to do things.	☐	☐	☐	☐	☐

*Ask yourself: How **important** is it to an **ideal job** for me; the kind of job I would most like to have?*

***Very Impt.** means very important; absolutely essential; cannot do without it.*

***Impt.** means important (but not quite very important).*

***N** means neither important nor unimportant; can't decide.*

***Not Impt.** means not important (but not quite very unimportant).*

***Very Unimpt.** means very unimportant; not essential at all; can do without it.*

On my ideal job, how important is it that . . .	Very Unimpt.	Not Impt.	N	Impt.	Very Impt.
26. I could do the kind of work I do best.	☐	☐	☐	☐	☐
27. I could be "somebody" in the community.	☐	☐	☐	☐	☐
28. The company would administer its policies fairly.	☐	☐	☐	☐	☐
29. My boss would handle his men well.	☐	☐	☐	☐	☐
30. I could be "on the go" all the time.	☐	☐	☐	☐	☐
31. I could do things that don't go against my conscience.	☐	☐	☐	☐	☐
32. I could make decisions on my own.	☐	☐	☐	☐	☐
33. I would get full credit for the work I do.	☐	☐	☐	☐	☐
34. I could take pride in a job well done.	☐	☐	☐	☐	☐
35. I could get ahead on the job.	☐	☐	☐	☐	☐
36. My supervisor would make good decisions.	☐	☐	☐	☐	☐
37. I could develop close friendships with my co-workers.	☐	☐	☐	☐	☐
38. I could be of service to other people.	☐	☐	☐	☐	☐
39. I could try something different on my own.	☐	☐	☐	☐	☐
40. I could work alone on the job.	☐	☐	☐	☐	☐
41. Working conditions would be pleasant.	☐	☐	☐	☐	☐
42. My pay would compare with that for similar jobs in other companies.	☐	☐	☐	☐	☐
43. The job would provide for steady employment.	☐	☐	☐	☐	☐
44. My work would not be routine or repetitive.	☐	☐	☐	☐	☐
45. I could supervise other people.	☐	☐	☐	☐	☐
46. I could do something that makes use of my abilities.	☐	☐	☐	☐	☐
47. I could "rub elbows" with important people.	☐	☐	☐	☐	☐
48. The company would keep its employees informed about company policies.	☐	☐	☐	☐	☐
49. My boss would back up his men (with top management).	☐	☐	☐	☐	☐
50. I could be busy all the time.	☐	☐	☐	☐	☐

*Ask yourself: How **important** is it to an **ideal job** for me; the kind of job I would most like to have?*

***Very Impt.** means very important; absolutely essential; cannot do without it.*

***Impt.** means important (but not quite very important).*

***N** means neither important nor unimportant; can't decide.*

***Not Impt.** means not important (but not quite very unimportant).*

***Very Unimpt.** means very unimportant; not essential at all; can do without it.*

On my ideal job, how important is it that . . .

	Very Unimpt.	Not Impt.	N	Impt.	Very Impt.
51. I could do things that don't harm other people.	☐	☐	☐	☐	☐
52. I could be responsible for the work of others.	☐	☐	☐	☐	☐
53. They would tell me when I do my job well.	☐	☐	☐	☐	☐
54. I could do something worthwhile.	☐	☐	☐	☐	☐
55. Promotions would be given out fairly on the job.	☐	☐	☐	☐	☐
56. My boss would delegate work to others.	☐	☐	☐	☐	☐
57. My co-workers would be friendly.	☐	☐	☐	☐	☐
58. I could help people.	☐	☐	☐	☐	☐
59. I could develop new and better ways to do the job.	☐	☐	☐	☐	☐
60. I could be alone on the job.	☐	☐	☐	☐	☐
61. The job would have good physical surroundings.	☐	☐	☐	☐	☐
62. The amount of work I do would be reflected in my pay.	☐	☐	☐	☐	☐
63. It would be a steady job.	☐	☐	☐	☐	☐
64. I could do something different every day.	☐	☐	☐	☐	☐
65. I could tell people what to do.	☐	☐	☐	☐	☐
66. I could make use of my abilities and skills.	☐	☐	☐	☐	☐
67. I could have a definite place in the community.	☐	☐	☐	☐	☐
68. The company would put its policies into practice fairly.	☐	☐	☐	☐	☐
69. My boss would take care of complaints brought to him by his men.	☐	☐	☐	☐	☐
70. I could be doing something much of the time.	☐	☐	☐	☐	☐
71. I could do the job without feeling I am cheating anyone.	☐	☐	☐	☐	☐
72. I could be free to use my own judgment.	☐	☐	☐	☐	☐
73. I could get recognition for the work I do.	☐	☐	☐	☐	☐
74. I could do my best at all times.	☐	☐	☐	☐	☐
75. The job would provide an opportunity for advancement.	☐	☐	☐	☐	☐

Ask yourself: How ***important*** *is it to an* ***ideal job*** *for me; the kind of job I would most like to have?*

Very Impt. *means very important; absolutely essential; cannot do without it.*

Impt. *means important (but not quite very important).*

N *means neither important nor unimportant; can't decide.*

Not Impt. *means not important (but not quite very unimportant).*

Very Unimpt. *means very unimportant; not essential at all; can do without it.*

On my ideal job, how important is it that . . .	Very Unimpt.	Not Impt.	N	Impt.	Very Impt.
76. My boss would provide help on hard problems.	☐	☐	☐	☐	☐
77. My co-workers would be easy to make friends with.	☐	☐	☐	☐	☐
78. I could do things for other people.	☐	☐	☐	☐	☐
79. I could try my own methods of doing the job.	☐	☐	☐	☐	☐
80. I could work independently of other people.	☐	☐	☐	☐	☐
81. The working conditions (heating, lighting, ventilation, etc.) on the job would be good.	☐	☐	☐	☐	☐
82. My pay would compare well with that of other workers.	☐	☐	☐	☐	☐
83. The job would avoid layoffs and transfers.	☐	☐	☐	☐	☐
84. I could do many different things on the job.	☐	☐	☐	☐	☐
85. I could tell others what to do.	☐	☐	☐	☐	☐
86. I could use my best abilities.	☐	☐	☐	☐	☐
87. The job would give me importance in the eyes of others.	☐	☐	☐	☐	☐
88. The company would treat its employees fairly.	☐	☐	☐	☐	☐
89. My boss and his men would have a good personal relationship.	☐	☐	☐	☐	☐
90. I could stay busy.	☐	☐	☐	☐	☐
91. I could do the work without feeling that it is morally wrong.	☐	☐	☐	☐	☐
92. I could have a very responsible job.	☐	☐	☐	☐	☐
93. I could get praise for doing a good job.	☐	☐	☐	☐	☐
94. The job could give me a feeling of accomplishment.	☐	☐	☐	☐	☐
95. There would be chances for advancement.	☐	☐	☐	☐	☐
96. My boss would train his men well.	☐	☐	☐	☐	☐
97. My co-workers would get along with each other.	☐	☐	☐	☐	☐
98. I could be of some small service to other people.	☐	☐	☐	☐	☐
99. I could try out some of my own ideas.	☐	☐	☐	☐	☐
100. I could be away from other workers.	☐	☐	☐	☐	☐

Minnesota Importance Questionnaire

(Forced-choice Form)

CONFIDENTIAL

Industrial Relations Center

University of Minnesota

The purpose of this questionnaire is to find out what you consider *important* to have in *your ideal job*, the kind of job you would most like to have.

On the following pages you will find *pairs* of statements about work.

—Read each *pair* of statements carefully.

—Decide which statement of the *pair* is *more* important to you in your *ideal* job.

—Check the box to the right of the statement you choose in each pair.

Do this for all pairs of statements. Work as rapidly as you can. Read each pair of statements, mark your choice, then move on to the next pair. Be sure to make a choice for *every* pair. *Do not* go back to change your answers to any pairs.

Remember: you are to decide which statement of the pair is *more* important to you in your *ideal* job.

MIQ: Form 3X

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November 1963

Ask yourself: Which is *more* important to me in my *ideal* job?

a. I could do something that makes use of my abilities ☐ a
1. or 1
b. The job could give me a feeling of accomplishment ☐ b

a. The job could give me a feeling of accomplishment ☐ a
2. or 2
b. I could be busy all the time ☐ b

a. I could be busy all the time ☐ a
3. or 3
b. The job would provide an opportunity for advancement ☐ b

a. The job would provide an opportunity for advancement ☐ a
4. or 4
b. I could tell people what to do ☐ b

a. I could tell people what to do ☐ a
5. or 5
b. The company would administer its policies fairly ☐ b

a. The company would administer its policies fairly ☐ a
6. or 6
b. My pay would compare well with that of other workers ☐ b

a. My pay would compare well with that of other workers ☐ a
7. or 7
b. My co-workers would be easy to make friends with ☐ b

a. My co-workers would be easy to make friends with ☐ a
8. or 8
b. I could try out some of my own ideas ☐ b

a. I could try out some of my own ideas ☐ a
9. or 9
b. I could work alone on the job ☐ b

a. I could work alone on the job ☐ a
10. or 10
b. I could do the work without feeling that it is morally wrong ☐ b

Ask yourself: Which is *more* important to me in my *ideal* job?

a. I could do the work without feeling that it is morally wrong ☐ a
11. or 11
b. I could get recognition for the work I do ☐ b

a. I could get recognition for the work I do ☐ a
12. or 12
b. I could make decisions on my own ☐ b

a. I could make decisions on my own ☐ a
13. or 13
b. The job would provide for steady employment ☐ b

a. The job would provide for steady employment ☐ a
14. or 14
b. I could do things for other people ☐ b

a. I could do things for other people ☐ a
15. or 15
b. I could be "somebody" in the community ☐ b

a. I could be "somebody" in the community ☐ a
16. or 16
b. My boss would back up his men (with top management) ☐ b

a. My boss would back up his men (with top management) ☐ a
17. or 17
b. My boss would train his men well ☐ b

a. My boss would train his men well ☐ a
18. or 18
b. I could do something different every day ☐ b

a. I could do something different every day ☐ a
19. or 19
b. The job would have good working conditions ☐ b

a. My boss would train his men well ☐ a
20. or 20
b. The job would have good working conditions ☐ b

Appendix B

Table B-1. MIQ item means and standard deviations: Total employed group (N = 2,309)

Item	Mean	Standard Deviation	Item	Mean	Standard Deviation
1.	4.2	.88	51.	4.2	.83
2.	4.3	.84	52.	3.2	.94
3.	4.4	.86	53.	3.8	.86
4.	4.1	.90	54.	4.2	.73
5.	3.4	.96	55.	4.3	.80
6.	4.4	.82	56.	3.6	.93
7.	2.9	1.03	57.	4.1	.73
8.	4.2	.86	58.	4.0	.78
9.	4.4	.83	59.	4.1	.82
10.	4.0	.87	60.	3.0	1.03
11.	4.0	1.08	61.	4.1	.84
12.	3.8	.89	62.	4.0	.91
13.	3.9	.90	63.	4.4	.76
14.	4.2	.77	64.	3.4	.97
15.	4.3	.89	65.	2.9	.96
16.	4.0	.98	66.	4.2	.78
17.	4.3	.77	67.	3.3	1.00
18.	4.1	.81	68.	4.3	.80
19.	3.8	.90	69.	4.2	.82
20.	3.3	1.06	70.	4.0	.78
21.	4.3	.80	71.	4.2	.82
22.	3.6	1.02	72.	4.0	.78
23.	4.4	.84	73.	4.0	.83
24.	4.0	.80	74.	4.3	.75
25.	3.2	.96	75.	4.3	.82
26.	4.3	.78	76.	4.2	.81
27.	3.0	.99	77.	4.0	.80
28.	4.3	.78	78.	3.9	.80
29.	4.3	.79	79.	3.9	.83
30.	3.3	1.04	80.	3.2	1.01
31.	4.2	.92	81.	4.3	.84
32.	3.9	.82	82.	4.2	.85
33.	3.9	.87	83.	4.3	.87
34.	4.3	.75	84.	3.8	.88
35.	4.3	.80	85.	3.0	.96
36.	4.3	.78	86.	4.2	.77
37.	3.8	.94	87.	3.1	1.06
38.	4.0	.80	88.	4.4	.77
39.	3.8	.88	89.	4.2	.89
40.	3.1	1.05	90.	4.0	.80
41.	4.2	.80	91.	4.3	.85
42.	4.2	.83	92.	3.8	.92
43.	4.4	.81	93.	3.7	.97
44.	3.8	.95	94.	4.2	.78
45.	3.1	.97	95.	4.2	.84
46.	4.2	.77	96.	4.2	.80
47.	2.6	1.01	97.	4.2	.76
48.	4.2	.82	98.	4.0	.76
49.	4.4	.84	99.	3.9	.84
50.	4.0	.82	100.	2.6	1.00

Table B-2. MIQ scale intercorrelation matrix: WAP disabled sample (N = 507)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Ability Utilization																			
2. Achievement	90																		
3. Activity	62	67																	
4. Advancement	73	77	54																
5. Authority	15	19	30	24															
6. Company Policies and Practices	77	80	58	74	14														
7. Compensation	65	69	51	75	24	69													
8. Co-workers	69	74	60	60	18	68	59												
9. Creativity	69	73	58	66	42	59	57	54											
10. Independence	10	16	27	12	35	09	21	15	31										
11. Moral Values	68	70	48	55	07	67	50	59	48	06									
12. Recognition	56	66	45	64	33	59	69	53	56	21	43								
13. Responsibility	61	68	56	60	59	55	55	50	80	36	47	56							
14. Security	72	74	59	75	09	76	71	65	52	09	64	52	47						
15. Social Service	74	79	63	59	22	68	53	71	61	16	66	50	59	62					
16. Social Status	01	08	17	13	60	02	23	11	26	36	−06	34	38	00	08				
17. Supervision—Human Relations	76	80	59	75	15	84	68	73	59	14	67	58	54	73	67	02			
18. Supervision—Technical	72	78	59	73	19	79	69	74	59	16	65	60	55	70	65	09	84		
19. Variety	64	66	59	58	34	53	54	51	72	26	43	47	65	54	55	17	52	49	
20. Working Conditions	74	76	55	69	09	76	74	68	54	13	63	56	48	75	62	03	74	73	53

Note: decimal points omitted.

Table B-3. MIQ scale intercorrelation matrix: WAP non-disabled group (N = 453)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Ability Utilization																			
2. Achievement	82																		
3. Activity	56	60																	
4. Advancement	67	70	48																
5. Authority	17	24	36	24															
6. Company Policies and Practices	67	72	54	70	09														
7. Compensation	58	61	45	66	30	56													
8. Co-workers	63	66	52	53	22	66	48												
9. Creativity	64	68	55	56	40	50	45	45											
10. Independence	20	24	35	15	37	14	25	20	33										
11. Moral Values	62	63	47	52	06	65	41	54	46	10									
12. Recognition	53	58	43	55	35	48	59	46	44	30	30								
13. Responsibility	61	62	56	57	59	46	45	42	75	36	40	50							
14. Security	58	65	46	65	17	69	61	66	42	19	54	48	40						
15. Social Service	62	70	58	48	25	58	36	64	58	22	59	38	53	49					
16. Social Status	18	23	30	20	56	10	33	21	32	37	02	45	40	11	22				
17. Supervision—Human Relations	70	72	55	66	20	81	59	73	52	19	58	55	52	68	61	18			
18. Supervision—Technical	59	65	52	55	25	69	53	68	46	28	53	49	46	62	51	24	74		
19. Variety	54	52	55	41	39	39	39	40	64	35	37	39	62	33	46	31	44	40	
20. Working Conditions	62	65	45	57	13	71	57	68	41	15	53	45	35	68	51	14	69	64	33

Note: decimal points omitted.

Table B-4. MIQ scale intercorrelation matrix: Nonskilled blue-collar group (N = 524)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Ability Utilization																			
2. Achievement	67																		
3. Activity	50	58																	
4. Advancement	60	56	30																
5. Authority	32	34	35	27															
6. Company Policies and Practices	60	63	43	61	15														
7. Compensation	49	52	37	54	25	54													
8. Co-workers	48	63	48	43	23	58	51												
9. Creativity	51	53	50	41	53	39	37	39											
10. Independence	15	22	39	08	50	[illegible]	15	08	37										
11. Moral Values	50	58	54	39	17	58	44	52	38	13									
12. Recognition	32	57	37	45	38	44	47	40	45	28	39								
13. Responsibility	50	58	55	45	67	41	33	41	68	45	44	49							
14. Security	56	58	41	52	10	66	56	53	34	05	49	35	32						
15. Social Service	52	63	57	37	41	45	35	61	57	24	53	36	54	38					
16. Social Status	30	36	37	34	65	23	35	30	42	45	22	43	50	15	38				
17. Supervision—Human Relations	53	58	45	54	13	73	50	52	37	08	52	47	36	59	40	19			
18. Supervision—Technical	53	60	52	55	25	68	54	58	44	20	55	51	48	59	49	32	69		
19. Variety	47	44	45	38	43	37	47	34	53	30	33	39	44	38	39	37	34	44	
20. Working Conditions	57	56	40	55	07	71	55	56	33	03	47	36	30	67	38	16	60	55	35

Note: decimal points omitted.

Table B-5. MIQ scale intercorrelation matrix: Nonskilled white-collar group (N = 322)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Ability Utilization																			
2. Achievement	71																		
3. Activity	48	45																	
4. Advancement	56	64	37																
5. Authority	16	24	28	27															
6. Company Policies and Practices	57	62	35	48	13														
7. Compensation	41	46	29	52	19	33													
8. Co-workers	41	50	38	37	24	45	38												
9. Creativity	28	37	23	35	55	27	26	34											
10. Independence	06	13	17	15	37	09	20	04	31										
11. Moral Values	41	48	30	25	07	50	32	32	24	12									
12. Recognition	34	56	29	40	31	34	42	30	35	28	23								
13. Responsibility	43	50	36	40	67	39	31	33	71	35	30	41							
14. Security	59	63	26	53	16	56	51	40	26	11	41	43	36						
15. Social Service	39	48	38	28	41	37	24	58	50	11	33	21	46	27					
16. Social Status	19	18	32	23	61	12	23	22	36	37	07	34	46	14	27				
17. Supervision—Human Relations	55	57	40	44	22	63	41	54	27	09	47	32	40	56	36	22			
18. Supervision—Technical	47	54	39	42	36	49	39	52	32	16	37	39	40	50	37	32	69		
19. Variety	40	43	59	38	37	34	37	39	34	33	28	40	42	30	36	27	39	40	
20. Working Conditions	58	57	36	47	03	54	49	46	19	08	47	31	29	54	32	12	45	41	32

Note: decimal points omitted.

Table B-6. MIQ scale intercorrelation matrix: Skilled white-collar group (N = 345)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Ability Utilization																			
2. Achievement	66																		
3. Activity	41	51																	
4. Advancement	51	58	29																
5. Authority	11	13	18	18															
6. Company Policies and Practices	46	50	35	48	−00														
7. Compensation	27	36	20	50	07	41													
8. Co-workers	48	49	46	33	08	48	24												
9. Creativity	47	56	40	39	43	32	22	39											
10. Independence	10	10	38	−01	18	11	23	26	31										
11. Moral Values	49	48	38	33	04	39	24	39	38	10									
12. Recognition	28	45	28	36	29	28	46	28	32	26	15								
13. Responsibility	37	49	39	44	65	26	24	28	70	25	30	39							
14. Security	45	43	31	46	04	46	35	44	26	19	45	31	21						
15. Social Service	47	56	49	34	31	33	12	54	56	21	43	26	46	27					
16. Social Status	08	12	19	16	56	00	24	12	28	30	08	31	43	09	20				
17. Supervision—Human Relations	41	49	35	42	07	66	41	50	39	16	43	35	33	43	38	09			
18. Supervision—Technical	40	49	42	44	26	52	36	57	46	27	37	42	44	42	50	24	68		
19. Variety	35	43	59	26	19	26	29	41	44	44	30	24	36	32	35	26	31	43	
20. Working Conditions	37	31	35	29	−01	42	34	43	22	26	32	21	18	38	27	02	32	37	28

Note: decimal points omitted.

Table B-7. MIQ scale intercorrelation matrix: Managerial group (N = 157)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Ability Utilization																			
2. Achievement	58																		
3. Activity	34	47																	
4. Advancement	28	39	08																
5. Authority	19	24	12	31															
6. Company Policies and Practices	27	33	19	29	21														
7. Compensation	21	21	19	41	29	14													
8. Co-workers	19	14	12	−00	03	33	11												
9. Creativity	52	53	45	26	25	17	23	14											
10. Independence	03	03	20	−06	24	−05	19	20	11										
11. Moral Values	29	28	27	08	12	32	00	52	21	09									
12. Recognition	24	35	10	45	39	23	50	15	19	31	11								
13. Responsibility	47	55	40	47	57	22	35	10	65	10	24	41							
14. Security	19	23	17	12	−05	28	12	45	−01	06	39	10	−00						
15. Social Service	28	38	31	07	18	19	16	44	43	21	38	16	26	24					
16. Social Status	17	07	12	23	49	03	30	23	17	35	16	32	35	10	16				
17. Supervision—Human Relations	35	46	31	34	18	52	31	38	33	10	34	31	37	31	35	07			
18. Supervision—Technical	31	43	40	29	22	34	24	43	35	22	42	29	41	25	35	20	55		
19. Variety	46	42	44	20	23	30	21	20	54	12	24	24	44	12	29	24	30	28	
20. Working Conditions	08	03	03	−00	−16	20	06	32	02	17	12	07	−11	36	22	−02	11	05	02

Note: decimal points omitted.

Table B-8. Communalities and estimated communalities for occupational groups

Variable	Communality				SMC[a]			
	NBC	NWC	SWC	M	NBC	NWC	SWC	M
1. Ability Utilization	56	60	49	44	62	63	54	45
2. Achievement	69	72	61	59	70	75	68	59
3. Activity	48	34	40	35	55	47	52	44
4. Advancement	49	46	42	32	56	54	55	45
5. Authority	68	68	61	49	65	64	60	53
6. Company Policies and Practices	73	56	55	29	72	56	55	43
7. Compensation	47	36	26	34	52	44	47	37
8. Co-workers	52	42	48	58	58	53	52	54
9. Creativity	56	51	57	59	59	57	62	62
10. Independence	38	23	18	22	39	28	40	35
11. Moral Values	46	33	36	39	51	40	42	41
12. Recognition	41	34	29	47	50	47	41	47
13. Responsibility	69	67	69	72	70	70	70	70
14. Security	60	55	40	38	59	56	43	38
15. Social Service	50	37	44	35	60	53	55	42
16. Social Status	49	43	39	39	52	47	41	42
17. Supervision—Human Relations	62	57	54	46	64	64	62	52
18. Supervision—Technical	63	49	55	45	64	57	62	49
19. Variety	39	39	36	38	44	49	49	42
20. Working Conditions	63	52	29	22	62	53	34	28

Note: decimal points omitted.

[a] Estimated communalities: squared multiple correlation coefficients.

Table B-9. MIQ scale intercorrelation matrix: College student group (N = 503)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Ability Utilization																			
2. Achievement	74																		
3. Activity	44	51																	
4. Advancement	50	49	28																
5. Authority	21	22	24	37															
6. Company Policies and Practices	50	55	38	50	15														
7. Compensation	34	35	24	65	33	45													
8. Co-workers	42	52	38	37	12	51	33												
9. Creativity	47	53	38	26	35	23	15	23											
10. Independence	10	11	11	−01	29	03	07	−07	35										
11. Moral Values	39	50	33	26	−03	48	20	45	25	−04									
12. Recognition	45	55	35	59	43	41	59	38	35	17	22								
13. Responsibility	53	53	37	37	55	25	28	25	68	31	26	43							
14. Security	42	44	23	59	17	48	58	46	12	−02	31	43	22						
15. Social Service	48	57	34	14	18	38	08	50	34	05	47	18	37	24					
16. Social Status	15	16	16	39	62	16	47	17	19	16	01	44	38	27	04				
17. Supervision—Human Relations	52	56	44	50	22	75	45	63	34	02	49	50	35	48	40	22			
18. Supervision—Technical	43	45	39	47	28	61	42	54	30	13	42	46	31	38	32	25	74		
19. Variety	44	53	57	29	29	27	23	39	55	20	29	36	46	25	33	12	36	33	
20. Working Conditions	42	46	31	50	12	56	49	55	19	−04	38	39	25	58	28	19	57	49	30

Note: decimal points omitted.